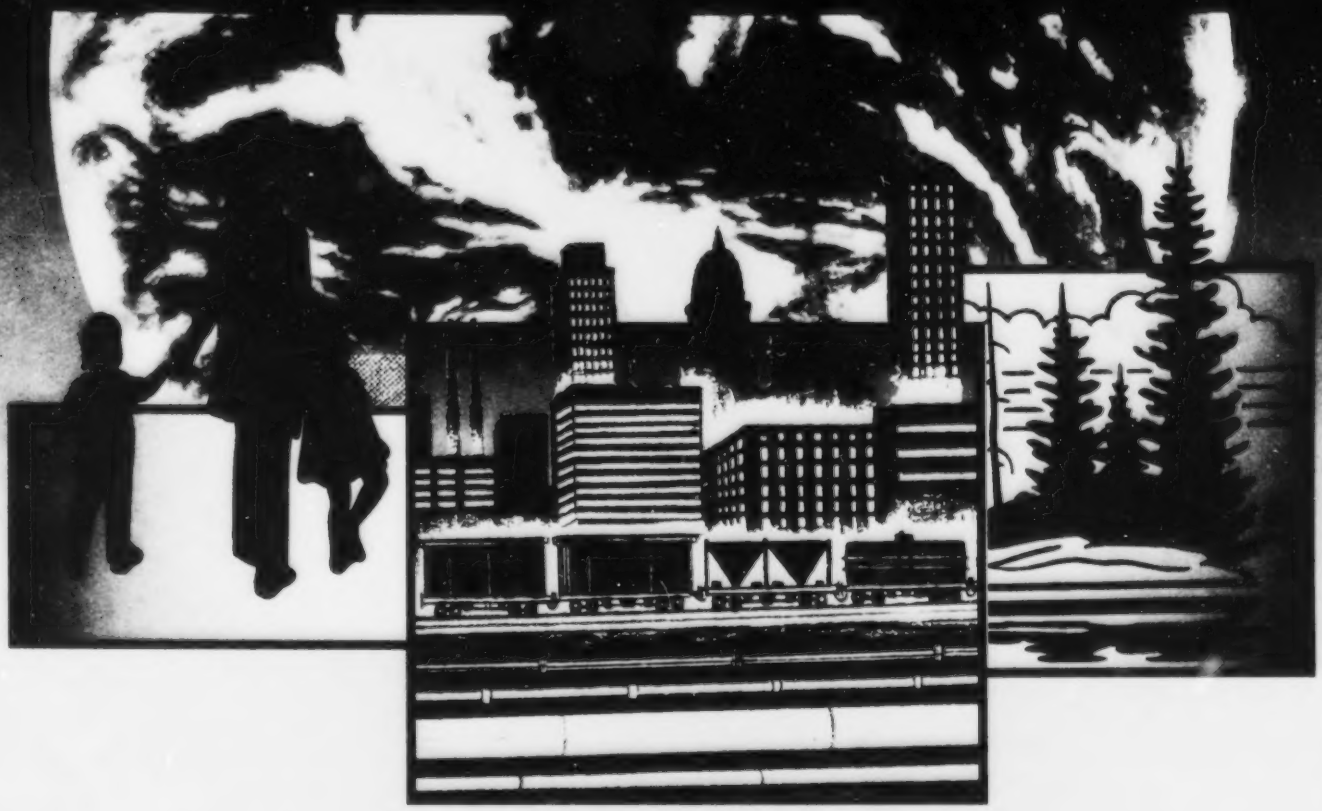
WORKBOOK



PROVINCIAL SUSTAINABILITY INDICATORS

Manitoba Round Table
for Sustainable Development

MINISTER OF CONSERVATION

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

To Concerned Manitobans:

Good information is key to good decision making. Sustainable development is a way of making decisions that balances the needs of today without sacrificing the ability of future generations to meet their own needs. This balancing act is often extremely difficult. The concept of sustainable development must be translated into the practical dimensions of the real world to make it operational. Proper indicators are needed to provide this information to tell us where we stand in regard to the sustainability of our province.

Consultations are now underway with Manitobans on a proposed set of sustainability indicators, as part of our legislated mandate under *The Sustainable Development Act*. Tracking sustainability indicators over time will help us understand linkages, connections and interdependencies between our environment, economy, human health and social well-being. It will help us measure performance in achieving provincial goals and provide a framework for future provincial sustainability reporting.

This is a draft workbook only. Issues and indicators presented are only suggested for your consideration and advice. Your taking part in the discussions will help to determine what is important. If issues and indicators that concern you are not highlighted, please bring it to our attention. We look forward to hearing from you.

Sincerely,

Oscar Lathlin
Minister

100-05567/

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INTRODUCTION

This workbook is part of the Sustainability Indicators Initiative undertaken by the Manitoba government in 1998. The purpose of the initiative is to develop a set of sustainability indicators that, when tracked over time, will provide Manitobans with timely, accurate information on important sustainability issues and trends. It is anticipated that reporting regularly on these indicators will help facilitate the establishment of provincial targets and policies for sustainable development, as well as provide a measure of performance in achieving provincial goals and objectives.

The authority for development of the indicators and preparation of future Sustainability Reports falls under *The Sustainable Development Act*, proclaimed in 1998. Under the Act, The Manitoba Round Table for Sustainable Development is charged with preparing the draft set of indicators, consulting with the public, and submitting a report to the minister on the proposed indicators and any related issues.

Process for Indicator Development and Reporting

The process for the Sustainability Indicator Initiative is based on a model from Tyler Norris, Redefining Progress and Sustainable Seattle, as presented in their Community Indicators Handbook, 1997. The basic steps are as follows:

- form a working group
- clarify purpose of indicators/initiative
- identify values and vision
- review existing models, indicators and data
- draft a set of proposed indicators
- convene a public participation process
- perform a technical review of indicators
- research the data
- publish and promote the report
- update the report regularly

The proposed indicators in this workbook were developed by the Sustainability Indicators Working Group, consisting of approximately 40 government and non-government members.

Development of the proposed indicators involved research into indicators now in use provincially, nationally and internationally. This was followed by the identification of major environmental, economic, health and social issues for the province, and proposals on how to measure them. Many of the indicators in this workbook, such as voting rate, will be familiar to most. Other proposed indicators will be less commonly recognized. **This workbook will be the main discussion document for the public participation process.**

Public Participation Process

The goals of the public participation process are to:

- broaden awareness and understanding of the sustainability indicators and reporting initiative;
- obtain opinions and feedback on the proposed indicators; and
- ensure meaningful involvement of community organizations and youth.

With initial work complete, public feedback on the proposed indicators is needed. The questions to be answered during the public participation phase of the Sustainability Indicators Initiative are:

- **Do the issues presented represent the key areas to track to help determine sustainability in Manitoba? Are any important issues missing?**
- **Given the indicator selection criteria (see page 4), do the proposed indicators sufficiently address the issues?**

- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**

A workshop structure has been developed for the public participation process. It will consist of background presentations; group discussions on indicators and opportunity to express concerns /suggestions; and presentation of main points to plenary. See the end of this introduction for how you can participate.

What is Sustainable Development?

Sustainable development, as defined in the Act, is "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development is an approach to daily decision-making that integrates probable consequences to the environment, economy, human health and social well-being. It is a way of making decisions that balances the needs of today without sacrificing the ability of future generations to meet their own needs.

This balancing act is often extremely difficult. How do we protect our environment, meet everyone's basic needs, keep our economy dynamic and maintain a just and healthy society, all at the same time? Sustainable development is about making difficult tradeoffs, about weighing all the options, and deciding on a course of action that considers everyone's interests, including our children's and grandchildren's.

What are Indicators?

Indicators are familiar to us, but we rarely call them indicators. Instead we call them signs, symptoms, signals, trends, warnings or measurements. Indicators are pieces of information that reflect the status of larger systems of which human society is a part. They are a mechanism for getting simplified feedback about natural, economic, and social systems that might otherwise be too complex to understand. When we can't see the condition of something directly, we use indicators to make those conditions visible. For example, a fever indicates that a person is fighting infection, but it doesn't tell what the infection is.

While indicators don't tell us everything, they should tell us enough to make good decisions possible. A person with a fever may feel better after resting, drinking more liquids, and taking medication. Or, he or she may decide to see a doctor. Either way, having concise, pertinent information enables that person to decide on the best course of action.

What are Sustainability Indicators?

The Sustainability Indicators Working Group adopted the following definition to describe Manitoba's sustainability indicators and their relevance to Manitobans.

Sustainability indicators provide information on the key vital signs of Manitoba's environment, economy, human health and social well-being. The indicators measure change/progress toward the vision of sustainable development as identified by Manitobans in The Sustainable Development Strategy for Manitoba (1994)[1]. *Information gained through tracking indicators over time can enhance the decision-making process to help ensure present and future needs of Manitobans are met.*

[1] "The vision for Manitoba is economic growth which is environmentally sustainable. In our vision the environment will be clean, safe and healthy; and our economy will provide the ongoing wealth and ability to provide the goods and services for both present and future generations of Manitobans in an environmentally sound manner." – Sustainable Development Strategy for Manitoba 1994.

Why Do We Need Sustainability Indicators?

Current ways of tracking trends often don't provide a full picture. Growth in job numbers, housing starts and new road construction may be positive for the economy, but if the result is more exurban growth, air pollution and homelessness, the overall health of the community suffers. New measures that help to determine a balance between economic, environmental, and social concerns are needed. More important is the integration of these concerns so that they are no longer seen as competing interests.

The concept of sustainable development has to be translated into the practical dimensions of the real world to make it operational. We must be able to recognize the presence or absence of sustainability, or threats to sustainability, in the systems under our stewardship. We need proper indicators to provide this information to tell us where we stand in regard to the goal of sustainability.

Tracking sustainability indicators will help us understand linkages, connections, and interdependencies between our environmental, economic, health and social systems. The first law of ecology states that "everything is connected to everything else." This proposed set of sustainability indicators for Manitoba will attempt to show how changes in one system may have an impact (positive or negative) in other systems.

Framework for Sustainability Indicators

The organization of the draft sustainability indicators will be based on a modified framework from the Prairie Ecozone Focus Chapter of the 1997 State of Environment (SOE) Report. The modified framework consists of three dimensions - environment; economy; and human health and social well-being (See figure 1). There are 23 categories presented in the workbook. Each category cuts through all three dimensions of the framework. Under each category, issues and proposed indicators to address that issue are presented. The indicator's relevance to sustainability in Manitoba is discussed and information on the availability of data is presented. This framework helps to ensure all aspects of sustainable development are addressed.

Within the framework, the environmental dimension focuses on current stocks, flows and conditions of the environment and natural resources. It includes issues and indicators related to the categories of biodiversity and habitat conservation, wildlife, air, water, fish, forests, minerals and soil.

The economic dimension includes issues and indicators related to the categories of land use and human settlement, agriculture and food, energy, consumption, economic activity, demographics, basic services and employment.

The human health and social well-being dimension focuses on human life, community assets, and the equitable allocation of assets within and between generations. It includes issues and indicators related to the categories of education and training, equity and rights, community and culture, governance, health, justice, and perceived quality of life.

Figure 1. Framework for Sustainability Indicators

Each category cuts through all dimensions of the framework.

Indicator Selection Criteria

The indicator selection criteria was developed by the Sustainability Indicators Working Group through evaluation of existing selection criteria used by other organizations and in the Prairie Ecozone Chapter of the 1997 SOE Report. The following criteria were used to help guide selection of the proposed indicators:

- **Provides Links:** Is the indicator useful in linking environmental, economic, social and human health concerns and benefits?
- **Policy-relevant:** Does the indicator have relevance for policy decisions for all people?
- **Understandable and easy to interpret:** Can the indicator be presented in an easily understandable, appealing way to the target audience?
- **Credible and acceptable:** Does the indicator measure something that is important to you and your community? Is the information based on scientific, traditional or community knowledge? Is it reliable, trustworthy, and relevant?
- **Valid:** Is the indicator based on an established form of information collection and measurement, either through scientific, traditional or community knowledge? Will the information be collected in the same manner from year to year?
- **Available and accessible:** Is the indicator based on good quality information that is obtainable and accessible over time, at a reasonable cost?
- **Sensitive to change:** Is the indicator sensitive/responsive enough to small changes in the system, while still adequately reflective of the long-term trend? Is the measure at the proper level of subtlety to reflect the issue at hand? Will it give an early warning of the issue and reflect incremental change?

Ideally, an indicator should meet all the above criteria. However, in practice, it is rare for all criteria to be met in a single indicator. For example, an indicator that is understandable and easy to interpret may over-simplify the issue. Overall, the indicator set needs to be as balanced as possible in terms of the coverage and representation of issues. Choosing only indicators that match all the criteria specified above would mean that some important issues would not be covered.

Both ***quantitative*** and ***qualitative*** indicators are presented in the workbook. Quantitative indicators are those that can be measured by quantity or amount. Qualitative indicators usually involve survey work, measuring attitudes and feelings. The two types of indicators used together should provide a well-rounded picture of our journey toward sustainability in Manitoba.

Terms and Definitions

Throughout the workbook, unfamiliar terms have been bolded and italicized. They are defined in a glossary starting on page 67. A list of sources for information is also provided starting on page 72.

Why are These Indicators Relevant to Me?

Good information is key to good decision making. Tracking the right information over the long-term will help us to:

- assess Manitoba's sustainability;
- establish provincial targets and policies for sustainable development;
- measure performance in achieving provincial goals and objectives; and
- provide a framework for future provincial sustainability reporting.

Taking part in the discussions will help to determine what is important and the best way to measure it. This ensures that all current and long-term priorities of Manitobans are considered during the final indicator selection process.

What Will Happen to My Suggestions?

The sustainability indicators in this workbook are being proposed for discussion. Your suggestions will be used to confirm, refine and improve the indicator set. All comments will be presented in a public report following the public participation process.

In developing a set of sustainability indicators, it is important to remember that not everything can be tracked. Too many indicators would complicate analysis of trends and compromise understanding. The cost of collecting information would also increase. Therefore, we must choose the indicators that are most relevant and provide the best information about Manitoba. The indicators must address concerns. An ad hoc collection of indicators that just seem relevant is not adequate. A systematic approach must look at the interaction of systems and their environment.

While all comments made during the public participation process will be considered, some suggested indicators might not become part of the final set that is presented to government. The need to have a concise set of indicators means that choices must be made. However, the indicator set will change over time in response to changing circumstances and priorities. Suggested indicators that are not viable today may become part of a future set.

How Do I Participate in the Public Participation Process?

Getting involved is easy:

- You may attend a public workshop in your region of Manitoba to provide your suggestions.
- You may wish to complete the attached questionnaire and/or put your suggestions in writing and submit them to:

  Provincial Sustainability Indicators Initiative
  Manitoba Conservation
  Suite 160 - 123 Main Street
  Winnipeg, Manitoba, R3C 1A5.

- You may visit us on our website at www.susdev.gov.mb.ca/indicators after April 30 and record your comments.

ENVIRONMENTAL DIMENSION

BIODIVERSITY AND HABITAT CONSERVATION

WILDLIFE

AIR

WATER

FISH

FORESTS

MINERALS

SOIL

1.0 Biodiversity and Habitat Conservation

The biodiversity and habitat conservation category deals with the health of habitat for wild plants and animals as a measure of our efforts to conserve biodiversity. It also deals with the status of public lands, whether they are protected from development, the health of ecosystems and the ecological services provided our society from public lands.

Linkages

It is proposed that the indicators in the biodiversity and habitat conservation category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Employment, culture and heritage preservation, traditional rights, spiritual and physical well-being, mobility and access to communities, human health services from our natural lands
Environmental:
Ecosystem health services and integrity, water quality, climate change, wildlife, endangered species, forest health, land use and protection
Economic:
Land use, fish and forest harvest, agriculture, mining, energy, tourism

What Do You Think?

As you read and discuss the biodiversity and habitat conservation category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

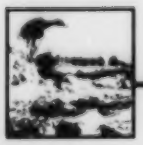
1.1 Issue: Natural Lands and Protected Areas

Manitoba's natural lands play an important role in sustaining life and preserving ***biodiversity***. ***Conservation*** of lands in a natural state is essential for plant and animal health as well as for human well-being. It is important to track how much land is designated and protected in Manitoba. How well Crown lands are managed and protected determines whether ecosystems can sustain their functions and the plants and animals that live there. The final indicator(s) for this issue should give us an overall picture of the natural lands designated or protected and ***ecosystem*** health, representation of ***natural regions*** and ***enduring features***, impacts from development, and maintenance of ***ecological integrity***.

Proposed Indicator

1.1 (a) Total designated and protected land. This indicator refers to the number of hectares of Crown land in Manitoba designated as parks, park reserves, ecological reserves, wildlife management areas and provincial forest, and their level of protection. Logging, mining, hydroelectric development and oil and gas exploration are prohibited in protected areas. Various Crown land designations are also protected areas. Other activities that may significantly affect ***habitat*** are also restricted in protected areas. This indicator would tell us whether we are completing Manitoba's Network of Protected Areas, as identified in the new *Parks Act*, and the provincial Action Plan for a Network of Protected Areas through the Protected Areas Initiative, a program of Manitoba Conservation.

Degree of representation of Manitoba's natural regions would be examined as well. A natural region is a geographic area that has similar landforms, soils, geology, climate and vegetation. Degree of representation of Manitoba's natural regions is based on the protection of enduring features in protected areas in a network for all of Manitoba's natural regions. Completing our network of protected areas, and achieving representation of our natural regions will provide habitat for most of our wild plants and animals. Maintaining the ecological integrity of our protected areas will also mean we are protecting our landscapes and ecosystem functions. The representation indicator will tell us how we are doing by enduring feature, by natural region, and overall in completing our network of protected areas. This method to plan and assess protected areas has been used in Manitoba for several years.



1.2 Issue: Habitat Loss

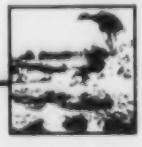
The greatest threat to wildlife species and biodiversity is habitat loss. One of the main causes of this loss is impact from human activity. Prohibiting development and limiting human activities in protected areas is essential to protect habitat. It is important to know the condition of protected areas and whether they are under stress from development. Minimum impact from development on designated and Crown lands will also maintain habitat. Many of Manitoba's natural Crown lands are used for a variety of purposes, but not all of these uses are compatible with wildlife habitat. Many feel that regardless of other measurable values, our natural and protected lands have an ***intrinsic value*** to society. We are only learning to put quantitative value to ecological and ecosystem services. The final indicator(s) for this issue should give us an overall picture of the success or failure of our efforts to reduce habitat loss and fragmentation, while maintaining our protected areas and conserving biodiversity on public lands.

Proposed Indicator

1.2 (a) Pressure from development. Our open Crown lands, designated and protected areas often are impacted by development activities. This indicator will measure intact ecosystems, designated and protected areas by identifying roadless areas over time. Degree of fragmentation - amount of roads and corridors - can be measured and compared so we know whether roadless areas are being maintained. Roadless areas provide the greatest likelihood for survival of many species and hence Manitoba's biodiversity. Fragmentation of our natural landscapes disrupts species migration patterns, allows over hunting, changes natural predator patterns, and often reduces drainage and water services. Significant fragmentation also reduces forest or grasslands biodiversity overall. The kilometres of roads and corridors would be calculated in square kilometres and square hectares so that roadless areas status can be compared. The trend over time should tell us whether we are successful in maintaining habitat, minimizing impacts from roads and corridors in protected areas, open Crown lands, and designated lands. This measure of pressure from development can be applied to natural regions, watersheds, and specific areas on a comparative historic basis.

Data Availability

Total designated and protected land: Data available from Manitoba Conservation; collected from 1920's - present; available on a varied frequency.
Pressure from development: Data available from Manitoba Conservation.

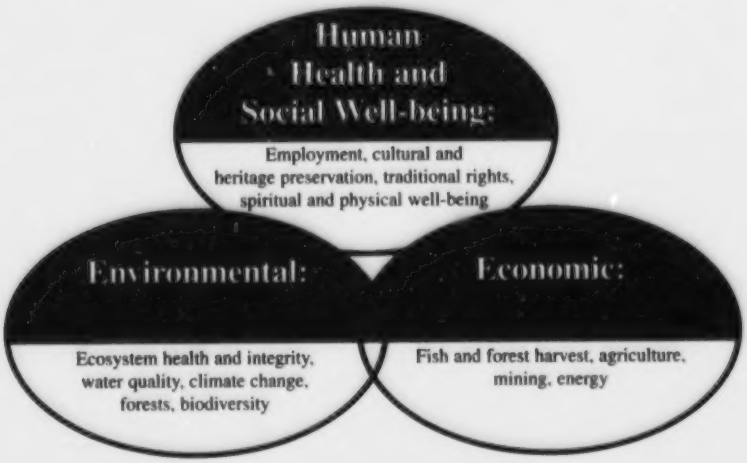


2.0 WILDLIFE

The wildlife category deals with the health and quantity of wild plant or animal species.

Linkages

It is being proposed that the indicators in the wildlife category have interdependencies and/or impacts on many others issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Employment, cultural and heritage preservation, traditional rights, spiritual and physical well-being
Environmental:
Ecosystem health and integrity, water quality, climate change, forests, biodiversity
Economic:
Fish and forest harvest, agriculture, mining, energy

What Do You Think?

As you read and discuss the wildlife category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

2.1 Issue: Species Diversity

Wildlife species in Manitoba include those that are found naturally or have existed in the province for a long period of time. Of these species, some may be classified as threatened or endangered. Keeping track of key plant and animal species, where they are located, and how abundant they are can help indicate the health of our ecosystems. Fluctuations in populations of wild plants and animals are common. Disease, weather, temperature extremes, naturally occurring fires, competition among species, ***predation***, and exotic nuisance species all affect wildlife populations and species diversity. The final indicator(s) for this issue should give us an overall picture of health of the province's wildlife. Wildlife links strongly to biodiversity and habitat conservation.

Proposed Indicator

2.1 (a) Distribution of indicator and exotic nuisance species. This indicator would track those species whose relative presence or absence "indicate" that certain conditions prevail. These ***indicator species*** can be used to monitor how much of a certain factor is present. The indicator would also examine threatened and endangered species, migratory birds, under and over population of species, and ***exotic nuisance species***. Exotic nuisance species are non-native species that have moved in or been introduced from other places, and are competing for food and habitat or negatively affecting native species. Tracking exotic nuisance species is important because they don't usually have natural predators in their adopted homes. A comprehensive list of indicator species is yet to be developed in Manitoba.

Data Availability

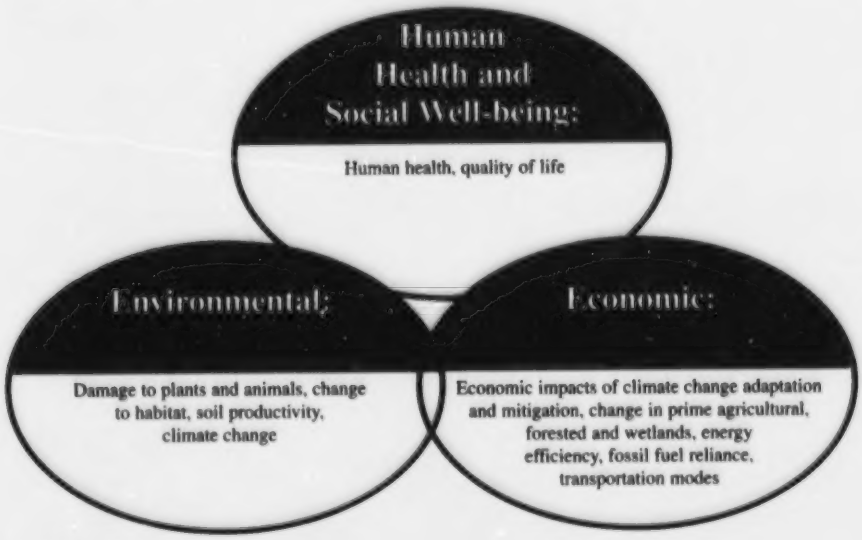
Distribution of indicator and exotic nuisance species: Data available from multiple sources; (1) Manitoba Agriculture and Food - Crop Insurance Program; collected from 1980's - present; available on an annual basis. (2) Manitoba Conservation; collected on a project specific basis; available on a varied frequency. (3) Conservation Data Centre.

3.0 Air

The air category deals with the quality of air, including cross-border air issues.

Linkages

It is proposed that the indicators in the air category have interdependencies to and/or impacts on many others issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Human health, quality of life
Environmental:
Damage to plants and animals, change to habitat, soil productivity, climate change
Economic:
Economic impacts of climate change adaptation and mitigation, change in prime agricultural, forested and wetlands, energy efficiency, fossil fuel reliance, transportation modes

What Do You Think?

As you read and discuss the air category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

3.1 Issue: Air Quality

Good air quality is key to the health of all life. Manitoba generally enjoys excellent outdoor air quality and problems tend to be localized. The main sources of pollutants are industrial and agricultural operations and vehicle emissions. A variety of chemicals create smog and ***acid precipitation,*** damage the stratospheric ozone layer and increase the ability of the atmosphere to trap heat. Stratospheric, or upper atmosphere ozone filters out most of the sun's harmful ultraviolet (UV) radiation. Until the late 1980s, aerosols, propellants and refrigerants typically contained ***chlorofluorocarbons*** (CFCs). Once released into the atmosphere, these chemicals broke apart and formed other compounds, which caused the stratospheric ozone layer to thin. CFCs are also ***greenhouse gases***, along with carbon dioxide, methane and others. Greenhouse gases trap the sun's heat and scientists believe these gases are responsible for changes in the world's climate. ***Sulphur dioxide***, a pollutant from industrial sources, is responsible for acid precipitation. Indoor air quality meeting national standards is currently not tracked. The final indicator(s) for this issue should give us an overall picture of our efforts to deal with air quality problems.

Proposed Indicators

3.1 (a) Urban Air Quality Index (AQI). The AQI is a system for reporting on air quality in cities, where most serious air quality problems exist due to vehicle emissions. The index considers four common pollutants that can affect human health or the environment. They are carbon monoxide, inhalable particulates, nitrogen dioxide and ground level ozone. Individual pollutant levels are measured hourly and compared to provincial air quality standards. The AQI is currently tracked only in Winnipeg and Brandon. Most provinces use an AQI to track air quality in their major cities.

3.1 (b) Greenhouse gas emissions. Greenhouse gases include carbon dioxide, methane, nitrous oxide, CFCs and ground-level ozone. This indicator would tell us the amount and type of greenhouse gases emitted, which sectors release the most, and how we compare to other jurisdictions. Possible related climate trends and adaptation efforts would be discussed in the analysis. Emission levels would be related to Canada's internationally agreed upon reduction target and 1990 ***baseline*** level, established to address the issue of ***climate change***.

Data Availability

Urban Air Quality Index: Data available from Manitoba Conservation; collected from 1970 - present; available on a daily and annual basis.
Greenhouse gas emissions: Data available from Environment Canada; from base year 1990 - present; available on an annual basis.

4.0 WATER

The water category deals with the quality, quantity and use of surface and groundwater supplies.

Linkages

It is proposed that the indicators in the water category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Availability of drinkable water supplies, human health, community stability
Environmental:
Biodiversity, soil erosion, forest conservation, health of wildlife and fish, leachate from mining sites
Economic:
Agricultural and industrial uses, delivery of basic services

What Do You Think?

As you read and discuss the water category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

4.1 Issue: Water Quality

The quality of Manitoba's water is a growing public issue. Good quality water is important to sustaining life. Despite Manitoba's record of good water quality management, there are regions where water quality is deteriorating. Water quality can vary, affecting its use and value, and the health of living things that use it. Inadequately treated water supplies can increase the risk of communicable disease. Groundwater can become contaminated from various activities. The final indicator(s) for this issue should give us an overall picture of the quality and use of surface and groundwater in Manitoba.

Proposed Indicator

4.1 (a) Manitoba Water Quality Index (WQI). The index uses 25 variables to assess water quality in Manitoba. Water quality objectives that have been set for these variables include bacteria, dissolved minerals, suspended sediments, plant nutrients related to ***eutrophication***, toxic materials, trace metals and agricultural chemicals. The premise of the WQI is that water quality is excellent when all guidelines or objectives are met. With each failure to meet objectives, water quality declines. Water quality is rated for human consumption, aquatic life and wildlife habitat, irrigation, livestock and recreational purposes. The WQI is monitored across the province and can be compared across Canada. The quality of groundwater is also very important to track, as about half of the province's 300 municipal systems use groundwater supplies. Groundwater that supplies municipal systems is sampled routinely. However, outside of special studies, private wells are not tested on a regular basis. These studies will be included in the analysis, if possible.

4.2 Issue: Water Quantity and Use

While Manitoba has an abundance of good quality water, it may not always be available where and when it is needed and in the amounts required. Rates of water consumption in Manitoba are high, even in comparison to other provinces. As good water supplies become scarce, the need to conserve water increases. Increased economic activity will place more demands on water and could affect water quality. Water quality, quantity and use need to be considered together to get a full picture of the state of water resources in the province. The final indicator(s) for this issue should give us an overall picture of whether our efforts at conservation and efficiency have reduced water consumption and ensured a supply for future generations.

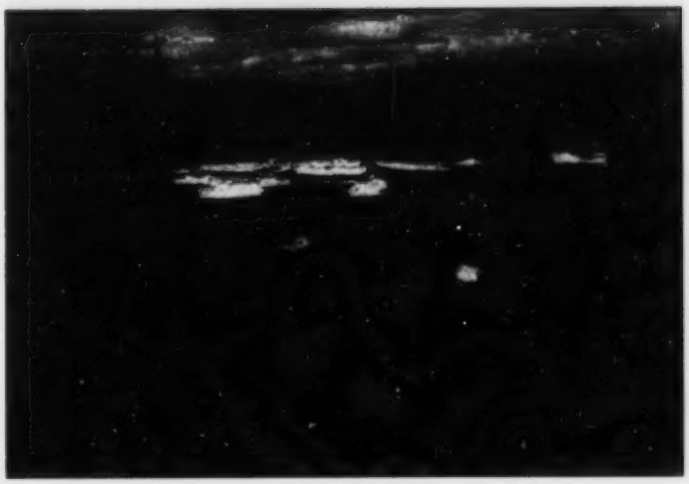
Proposed Indicator

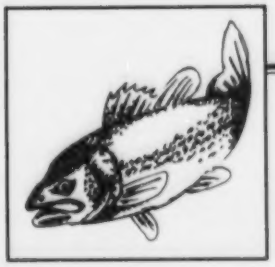
4.2 (a) Water consumption. This indicator refers to the amount of water that flows through the province's municipal water systems annually, expressed as a percentage of available supply. The total amount consumed would be divided by the population served to get the ***per capita*** amount consumed. Water consumption includes water used by homes, schools, hospitals, businesses, and industries. The price of water paid by consumers would be examined in the analysis of this indicator. The indicator does not provide information on individuals using private wells. Information on water quantities in the province would be presented if possible.

Data Availability

Manitoba Water Quality Index: Data available from Manitoba Conservation; collected from 1965 - present; available on a monthly basis.

Water consumption: Data available from Manitoba Conservation; collected from 1960's - present; available on a varied frequency by region.



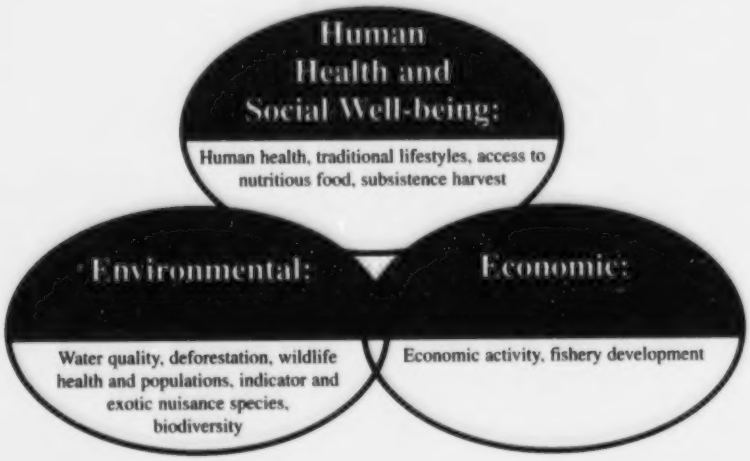


5.0 FISH

The fish category deals with the health, quantity, distribution and use of fish.

Linkages

It is proposed that the indicators in the fish category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Human health, traditional lifestyles, access to nutritious food, subsistence harvest
Environmental:
Water quality, deforestation, wildlife health and populations, indicator and exotic nuisance species, biodiversity
Economic:
Economic activity, fishery development

What Do You Think?

As you read and discuss the fish category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

5.1 Issue: Fish Conservation and Biodiversity

Manitoba's waterways support more than 90 species of fish. Sustaining a healthy fish population means ensuring diversity of species, as well as healthy populations within species. Loss or degradation of fish habitat is a major issue in the conservation of fish populations. Loss of habitat stems from factors such as urbanization, deforestation, flood control, mining and hydroelectric development causing water alteration. Overfishing affects our fish populations as well and is discussed under the issue of fish harvest. Knowing the trends in fish populations is important in developing efficient and effective fishery policies. The final indicator(s) for this issue should give us an overall picture of the health of our fish population.

Proposed Indicator

5.1 (a) Fish species diversity and population. This indicator would track the number of known species of fish in Manitoba waterways and their relative numbers. It would also include identification of ***aquatic nuisance species***. When new species invade an ecosystem, they compete for food and can alter habitat. The impact of rehabilitative and corrective measures to protect fish habitat and waterway conditions will be discussed in the analysis of this indicator. It will also discuss steps taken to help ensure potential harm to fish populations caused by dams and other man-made structures is minimized.

5.2 Issue: Fish Harvest

Commercial fishing is important to Manitoba's economy. Fish are also harvested for subsistence purposes and traditional uses. Commercial fishing is based on a quota system that determines the total weight of fish that can be harvested from a lake. Commercial fishing quotas are intended to set the harvest of a fish stock at a level that, when used in conjunction with an appropriate net size, protection of spawning fish and regulated fishing areas, should ensure the long term sustainability of fish stocks. Manitoba's current approach to setting commercial quotas is based on the concept of ***Maximum Sustainable Yield (MSY)***. This approach does not account for year to year variation in ***year class strength***, nor does it protect a specific amount of spawning stock. The relationship between effort used to catch fish and the actual catch provides information on the abundance of fish in a particular lake. This information will help to determine whether we are harvesting fish at sustainable levels, within replacement capacity of populations. The final indicator(s) for this issue should give us an overall picture of the long-term survival of fish populations and species.

Proposed Indicator

5.2 (a) Commercial harvest. The commercial harvest of fish can put pressure on fish stocks. This indicator would provide information on the number and types of fish caught in Manitoba's four largest commercial fisheries: Cedar Lake, Lake Manitoba, Lake Winnipeg and Lake Winnipegosis. It would be related to MSY estimates. Commercial fishing effort would also be examined and linked to harvest. "Effort" is described as the intensity with which fishermen try to catch fish. With more effort, more fish are caught. The result is greater stress on fish stocks.

Data Availability

Fish species diversity and population: Data available from Manitoba Conservation; collected from 1979 - present; available on an annual basis.
Commercial harvest: Data available from Manitoba Conservation; collected from 1931 - present; available on an annual basis.

6.0 FORESTS

The forest category deals with the quality, quantity, distribution and use of forests.

Linkages

It is being proposed that the indicators in the forest category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Traditional and spiritual use of forests, non-market goods such as subsistence hunting and berry picking, education, quality of life, recreation
Environmental:
Biodiversity, climate change, wildlife habitat, air quality
Economic:
Wood supply, provincial economy, employment, tourism, road access

What Do You Think?

As you read and discuss the forest category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

6.1 Issue: Conservation of Forest Diversity

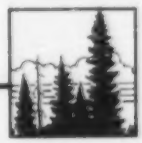
Forests provide wildlife habitat, moderate temperatures, improve air quality and minimize soil and water erosion. Forests play an important role in global cycles by recycling water, carbon, oxygen and other substances. The harvest of trees provides employment and a variety of wood products to meet human needs. Forests also provide food and medicines, revenue through tourism, education through ***ecotourism*** and places for recreation and spirituality. Maintaining the ecological and genetic diversity of the forest contributes to the health of plants, animals and insects The proposed indicators in this category are comparable to those used in other Canadian provinces, and based on national forest indicators developed by the Canadian Council of Forest Ministers (CCFM). The final indicator(s) for this issue should give us an overall picture of the health of the forest.

Proposed Indicator

6.1 (a) Forest type and age class. Natural and human-caused disturbances such as fire, insects, disease and logging, play a role in how forests age and the species of trees that regenerate. The more frequent the disturbance, the more likely the forest will have trees of the same age. Age class distribution is an important indicator of forest diversity. Planning to maintain a diversity of age classes can contribute to to a full range of ecosystem types and wildlife habitats. Information on age class would be provided by ***ecozone***, and type of forest - coniferous, deciduous, or mixed. This information would be compared to historical information and to the total forested area of the province.

6.2 Issue: Forest Harvest

To ensure availability for future generations, forests must be harvested sustainably. This means the maintenance and enhancement of forest ecosystem function and services, as well as condition and productivity. Forests play an important role in the province's economy and contribute to the health of our environment and society. For some, cultural and spiritual well-being depends on the forest. All of these uses, and the effects of natural disturbances such as fire, insects and disease, and growth rates, must be balanced in forest planning. Monitoring current harvest practices and forest regeneration will help to ensure forests continue to support many uses. The final indicator(s) for this issue should give us an overall picture of whether current levels of harvesting ensures all forest uses and values will be possible and intact for future generations.



Proposed Indicator

6.2 (a) Annual allowable cut versus actual harvest. The ***annual allowable cut*** (AAC) is determined by ***sustained yield***. The volume of trees harvested cannot exceed the total volume of trees expected to grow in one year. AAC is the primary tool for determining wood allocation for large industries and individual forest operators. Calculations for AAC factor in other forest uses such as recreation areas and ecological reserves. This indicator would track the volume of trees harvested and compare it against the AAC.

Data Availability

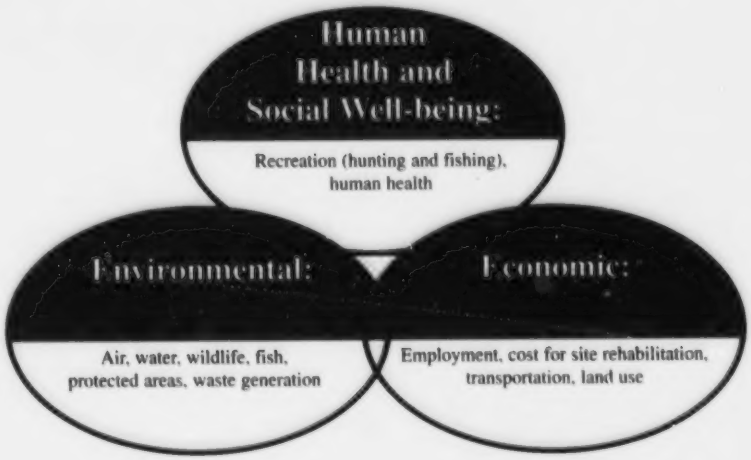
Forest type and age class: Data available from Manitoba Conservation; available every five years.
Annual allowable cut vs. actual harvest: Data available from Manitoba Conservation; available on an annual basis.

7.0 MINERALS

The minerals category deals with the quantity and use of mineral deposits, and mining activity and its impacts.

Linkages

It is proposed that the indicators in the minerals category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Recreation (hunting and fishing), human health
Environmental:
Air, water, wildlife, fish, protected areas, waste generation
Economic:
Employment, cost for site rehabilitation, transportation, land use

What Do You Think?

As you read and discuss the minerals category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

7.1 Issue: Mineral Inventory and Potential For Extraction

Manitoba's mineral resources are found where natural processes and conditions have resulted in a greater than normal concentration of a particular substance. Extensive geological records compiled over the past century help to determine if a site looks promising. The high cost of exploration and extracting minerals are important factors to consider before a mine is established. Therefore, tracking information about where mineral deposits are and whether they can be extracted economically is important to know. Mineral reserves are finite and must be managed in a sustainable manner. Reprocessing, recycling, and processing by-products offer new opportunities to conserve minerals, expand the potential supply and reduce environmental damage. By using more efficient technology and recovery processes, more waste can be recovered.

Proposed Indicator

7.1 (a) Identified reserves versus minerals extracted. This indicator would compare Manitoba's mineral reserves, in tonnes, to the actual amount of minerals extracted. Information would be provided on the type, amount and location of minerals in the province, and the number and area (in hectares) of production leases occupied in each provincial region. The amount and type of minerals recycled or reused would be included in this indicator. Recycling or reusing mineral products helps to conserve energy, reduce environmental damage to air, water and land and reduce pressure on landfill sites.

7.2 Issue: Mining Leachate Impacts

Mineral extraction, processing and manufacturing can have an adverse affect on the environment. All metal mines, whether open pit or underground, produce ***tailings***, the finely ground residue that remains after treatment has removed the metal. Some runoff from tailings is acidic and can pollute nearby rivers and lakes. It is important to track how much ***leachate*** is being produced from the mining industry and how it is being stored and treated to determine the impact it may have on water. The final indicator(s) for this issue should give us an overall picture of the environmental effects of the mining industry and whether initiatives undertaken have had success in reducing negative environmental effects.

Proposed Indicator

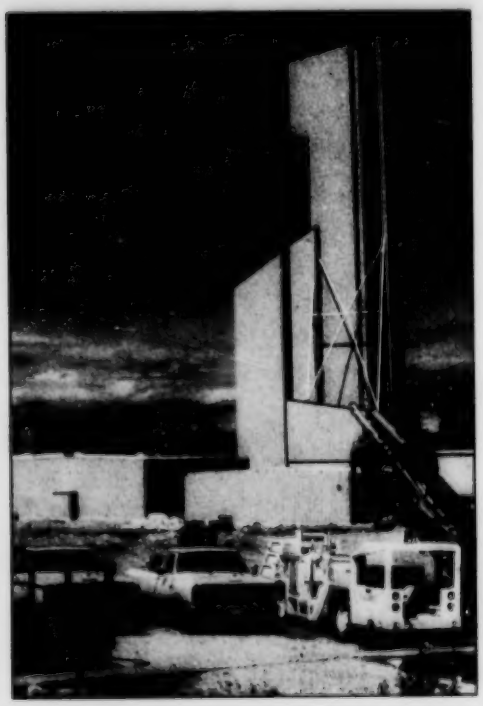
7.2 (a) Leachate from mining sites. This indicator would measure the quantity and type of leachate from mining sites in Manitoba and any effects on the environment. Information would also be provided on

efforts to reduce environmental impacts of mining. The trend over time should tell us whether co-operative efforts are having a positive effect and whether we are achieving reductions in leachate production. Heavy metals in water are captured in the Water Quality Index (WQI) and will be linked to this indicator.

Data Availability

Identified reserves vs. minerals extracted: Data available from Manitoba Industry, Trade and Mines; collected from 1990's - present; available on an annual basis.

Leachate from mining sites: Data available from Manitoba Conservation; collected from 1960's - present; available on a varied frequency.

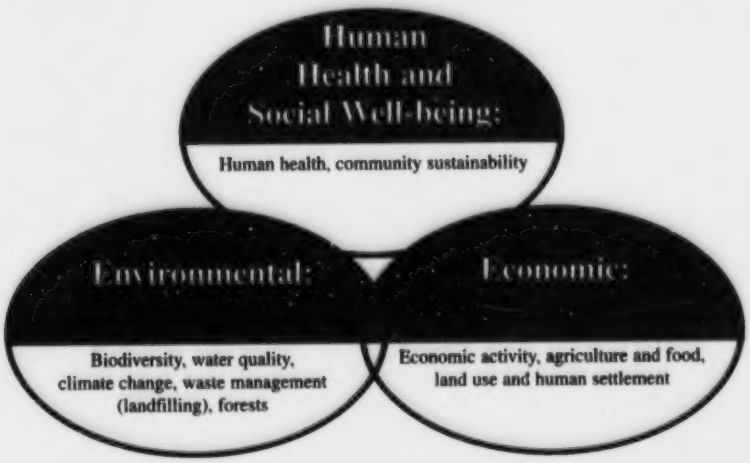


8.0 Soil

The soil category deals with the quality, quantity and productivity of soil.

Linkages

It is being proposed that the indicators in the soil category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Human health, community sustainability
Environmental:
Biodiversity, water quality, climate change, waste management (landfilling), forests
Economic:
Economic activity, agriculture and food, land use and human settlement

What Do You Think?

As you read and discuss the soil category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

8.1 Issue: Soil Quality, Quantity and Productivity

The productivity of soil depends on its quality and quantity. ***Erosion*** controls and changes in cropping, tillage and water management practices have increased the amount of soil cover and reduced erosion. Soil productivity is essential for the continued viability of agriculture. The final indicator(s) for this issue should give us an overall picture of soil quality. The soil category is strongly linked to the agriculture and food category.

Proposed Indicators

8.1 (a) Soil quality. This indicator would be measured through organic carbon levels in the soil. Carbon is the main component of soil organic matter, which is an essential component of soil. Loss of organic matter and thus of soil organic carbon, results in breakdown of soil structure, greater vulnerability to erosion and reduced fertility. This leads to reductions in yield and affects the long-term sustainability of the soil. Change in the levels of soil organic carbon are predicted with a computer model that uses simplified soil-plant-climate interactions to describe the dynamics of soil carbon and nitrogen.

8.1 (b) Risk of wind and water erosion on cultivated land. Erosion is a natural process that can be affected both positively and negatively by agricultural practices. Although it is possible to measure erosion on a field or small plot of land, it is difficult to measure erosion over large areas. Therefore, the change in erosion risk over time is calculated by considering the effects of changes in land use, cropping systems and tillage practices. This is a ***proxy*** measure for soil quantity.

Data Availability

Soil quality: Data available from Agri-Food Canada; collected from 1970 - present; available on a varied frequency.
Risk of wind and water erosion on cultivated land: Data available from Canadian Agri-environmental Indicator Report; collected since 1981; available on a varied frequency.

ECONOMIC DIMENSION

SE AND HUMAN
TTLEMENT

AGRICULTURE AND FOOD

ENERGY

CONSUMPTION

ECONOMIC ACTIVITY

DEMOGRAPHICS

BASIC SERVICES

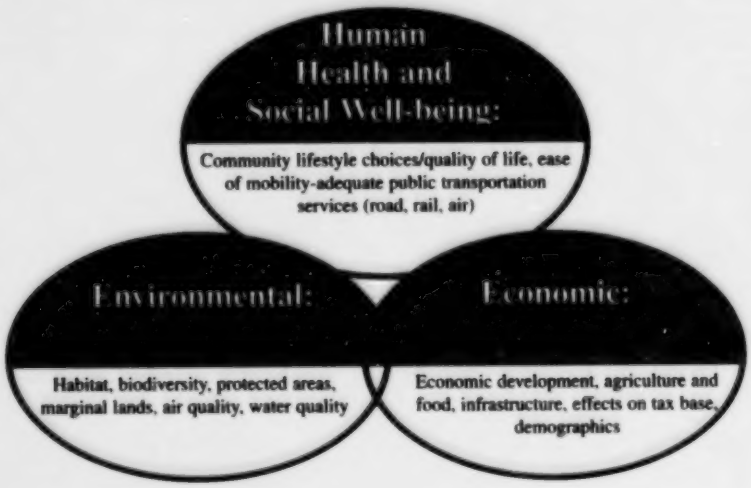
EMPLOYMENT

9.0 Land Use and Human Settlement

The land use and human settlement category deals with uses of land for human activity and settlement, and the impacts on other uses.

Linkages

It is being proposed that the indicators in the land use and human settlement category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Community lifestyle choices/quality of life, ease of mobility-adequate public transportation services (road, rail, air)
Environmental:
Habitat, biodiversity, protected areas, marginal lands, air quality, water quality
Economic:
Economic development, agriculture and food, infrastructure, effects on tax base, demographics

What Do You Think?

As you read and discuss the land use and human settlement category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

9.1 Issue: Land Use and Human Settlement

Land use decisions in one municipality may not be compatible with those in an adjacent municipality or an affected municipality. Land use is also affected by privatization of ***Crown lands***. Selling these lands to private interests could change current land uses and also have an impact on other uses. Knowing how land is being used and whether current uses are in keeping with provincial policies is important to determine whether we are using our land in a sustainable manner. Integral to land use are the patterns of human settlement on that land, and the resulting pressures on other uses.

Proposed Indicator

9.1 (a) Change in land use. This indicator would track the use of land over time, in hectares. It would provide information on agricultural land and cropland, deciduous forest, water bodies, grassland, rangeland, mixed wood forest, wetlands, bogs, treed rock, coniferous forest, burnt areas, open deciduous, forage crops, cultural features, forest cutovers, bare rock, gravel and sand, roads, rail, trails and built up areas. The number of hectares in production as a percent of arable land would be captured here, as would incentives for bringing marginal land into production Human settlement patterns, loss of agricultural land for urban development, prevalence of land use planning by municipalities and vitality of rural communities would be examined.

Data Availability

Change in land use: Data available from Manitoba Conservation; collected from 1996 - present; available on a varied frequency.

10.0 AGRICULTURE AND FOOD

The agriculture and food category deals with the viability of agriculture, management of land for production and processing and safety of food.

Linkages

It is proposed that the indicators in the agriculture and food category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Human health, access to nutritious food, equitable access, community sustainability, demographics (urban migration), quality of life
Environmental:
Land use, biodiversity, water quality, soil quality, air quality, climate change, waste management (landfilling)
Economic:
Economic activity, transportation access and cost, value-added economic activity, energy use

What Do You Think?

As you read and discuss the agriculture and food category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

10.1 Issue: Viability of Agriculture

Agriculture has a significant impact on the environment, economy, human health and social well-being. Uncontrollable factors like weather, flooding, low commodity prices, freight transportation costs, high debt load and subsidies paid to farmers in other countries are affecting the viability of many farms. Diversification into other products or services, or adding value to products may help some farmers stay in business and ensure the ability of Manitoba to sustain production of food and food products. Farm bankruptcies affect more than just the family who has lost its farm. Other businesses fail, communities suffer and a way of life disappears. In the long term, the security of our food supply could also be at risk.

Proposed Indicators

10.1 (a) Net farm income. This indicator refers to the income farmers receive after paying their expenses. It would include information on government subsidies to farms, the ratio of debt to capital assets and discussion around community survival.

10.1 (b) Number, size and type of farms. This indicator would provide information on farm ownership (i.e. sole proprietorship versus partnerships versus multiple owners), including new farmers and corporate farms. It would display the composition of the farming industry in Manitoba. Agriculture issues related to land use pressures would be discussed under the land use category.

10.1 (c) Farms using sustainable agricultural practices. ***Sustainable agricultural practices*** refers to practices such as growing forage crops in rotations or as permanent cover, growing winter cover crops, planting shelterbelts, strip cropping, using buffer strips, using conservation (or zero) tillage techniques, contour cultivation and organic farming. This indicator would provide information on the total acreage farmed using these practices and the type of practices being used. An appropriate mix of land management practices tailored to the conditions and needs of individual farms can provide multiple benefits for preserving soil health and productivity, minimizing water contamination, conserving wildlife habitat and maintaining nutrients. The social acceptability of agricultural practices is sometimes an issue. For example, stubble burning and livestock odours tend to raise complaints in communities. This would be discussed in the analysis of this indicator. *Note:* Through the public participation process, we must obtain a consensus that the practices we are putting forward here are considered "sustainable practices" by Manitobans.

10.2 Issue: Safety and Quality of Food

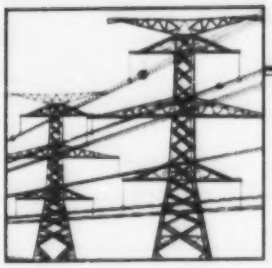
The safety and quality of food is crucial to human health and the viability of farming. Safety and quality are important at each stage of production, from raw materials to end product. Regulations help to ensure the safety of products. It is important to track the actions producers are taking to ensure safety of food products and whether these efforts are paying off when these products are inspected. The safety and quality of food could also be impacted by genetic alteration. Bioengineering is currently a controversial issue, however, there are no established indicators to measure the effect of genetically modifying food products. The final indicator(s) for this issue should give us an overall picture of food safety and quality.

Proposed Indicator

10.2 (a) Food meeting quality standards. This indicator would track food products, providing information on the percentage of total that meets quality standards. This information would be provided by commodity. The analysis of this indicator would be limited by the lack of information on impacts related to pesticide and herbicide use and genetic modifications of food.

Data Availability

Net farm income: Data available from Manitoba Agriculture and Food; collected from 1911 - present; available on an annual basis.
Number, size and type of farms: Data available from multiple sources; (1) Manitoba Agriculture and Food; collected from 1880's - present; available on an annual basis. (2) Statistics Canada; collected from 1991 - present; available every five years.
Farms using sustainable agricultural practices: Data available from Manitoba Agriculture and Food; collected from 1970's - present; available every five years.
Food meeting quality standards: Data for this indicator is unavailable at this time.



11.0 ENERGY

The energy category deals with current and potential sources of energy, including fossil fuels, hydro, solar, geothermal and wind, and their use.

Linkages

It is proposed that the indicators in the energy category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Employment, health, quality of life, community lifestyles
Environmental:
Greenhouse gases, air quality, fish, wildlife habitat and populations
Economic:
Fossil fuel industry, renewable energies industry

What Do You Think?

As you read and discuss the energy category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

11.1 Issue: Energy Efficiency and Conservation

Sustainable development requires being efficient and thoughtful about how we use energy, and taking responsibility for any adverse impacts. Production processes have improved and now use less energy. Therefore, it is possible to increase production without increasing energy use. Similarly, building codes have changed, resulting in newer buildings that are more energy efficient than older ones. Conserving energy is important to ensure that supplies will be available, at reasonable cost, to meet future needs. Non renewable fossil fuels such as oil, natural gas and coal are a major contributor to greenhouse gases that cause global warming and climate changes. Because our own supplies are limited, most of the fossil fuels used in Manitoba are imported from oil rich jurisdictions. Fossil fuels are finite and costs to develop and use new sources are high, both economically and environmentally. Reducing our dependence on out-of-province sources of fossil fuel energy would reduce greenhouse gas emissions. The final indicator(s) for this issue should give us an overall picture of our efforts to use energy more wisely.

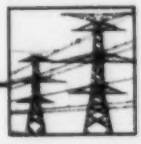
Proposed Indicators

11.1 (a) Energy efficiency. This indicator would be expressed as a ratio of energy consumption per dollar of real GDP, as well as per capita. This allows for comparison of our energy consumption to other jurisdictions, as well as with the relative increase or decrease in production of goods and services. Thus, if there is an increase in goods and services production levels and/or population, but energy consumption is down, meaning fewer emissions and waste, we are using our energy more efficiently. This indicator would include information on utility incentive programs and targets for consumption and emissions reductions, as well as energy efficiency in government buildings.

11.1 (b) Ratio of renewable energy consumption to total energy consumption. Renewable energy sources include hydroelectricity, solar ***photovoltaic cells***, wind, ***geothermal*** and ***biomass***. Renewable energies emit few, if any, pollutants and do not deplete finite resources. Tracking the changing ratio between renewable and non-renewable energy consumption would tell us whether or not we are moving to more sustainable energy sources. Any regional differences would be discussed in the analysis if possible.

Data Availability

Energy efficiency: Data available from Manitoba Conservation; collected from 1978 - present; available on an annual basis.
Ratio of renewable energy consumption to total energy consumption: Data available from Statistics Canada; collected from 1978 - present; available on an annual basis.

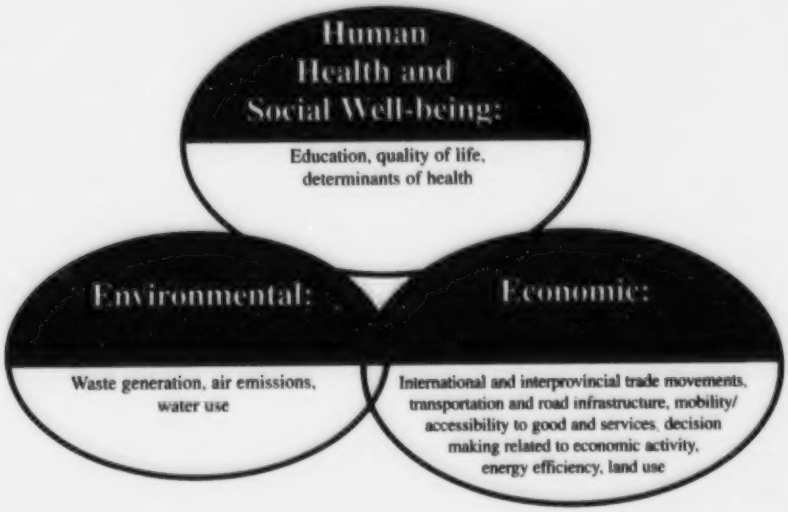


12.0 CONSUMPTION

The consumption category deals with the demand for and use of goods and services and the waste products resulting from their use.

Linkages

It is proposed that the indicators in the consumption category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Education, quality of life, determinants of health
Environmental:
Waste generation, air emissions, water use
Economic:
International and interprovincial trade movements, transportation and road infrastructure, mobility/ accessibility to good and services, decision making related to economic activity, energy efficiency, land use

What Do You Think?

As you read and discuss the consumption category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

12.1 Issue: Rate of Consumption

Consumption, or the purchase of goods and services, increases economic activity and is associated with an increase in standard of living. However, waste generation is associated with high levels of consumption and resource depletion, and producing waste is not sustainable, nor is it economically efficient. Unsustainable consumption of resources may compromise the ability of future generations to meet their needs. The final indicator(s) for this issue should give us an overall picture of consumption habits in Manitoba.

Proposed Indicators

12.1 (a) Ecological Footprint Index. The ***Ecological Footprint*** (EF) is an analysis of how much productive land it takes to support the levels of consumption of a defined area. Inherent are the ideas of ***carrying capacity*** and "importing sustainability" for a community by depleting the finite natural resources of another region. The City of Winnipeg is considering doing further work around an Ecological Footprint, and the provincial sustainability report would talk about implications for the province. The EF index operates under a number of assumptions and mathematical equations that may or may not be accurate. In addition, the EF does not take into consideration the social impacts, benefits or detriments of the consumption levels on the population being studied, or the population who is supplying the goods and services the studied population is consuming.

12.1 (b) Waste disposal per capita. This indicator would track the amount of waste (in tonnes) per capita going to landfills. In 1989, environment ministers from all Canadian provinces and territories made a commitment to reduce waste going to landfills by 50% by the year 2000. Programs under the Waste Reduction and Prevention (WRAP) strategy include tires, beverage containers and used oil. Packaging of consumer goods and how it contributes to the need for recycling and landfills for disposal would also be discussed. This indicator would not reflect problems with finding a market for some of the recyclable goods, and the current level of "stockpiling" of recyclables. The indicator is comparable across Canadian jurisdictions.

Data Availability

Ecological Footprint Index: Data for this indicator is available, but a full analysis has not been made of either the City of Winnipeg or Manitoba's EF.

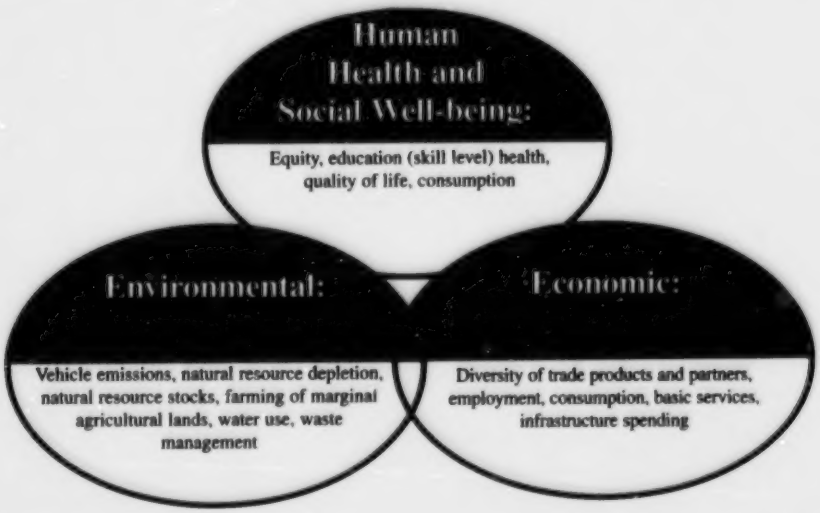
Waste disposal per capita: Data available from Manitoba Conservation; collected from 1991 - present; available on a varied frequency; and Canadian Council of Ministers of the Environment; collected from 1988 - present; available every four years.

13.0 Economic Activity

The economic activity category deals with the production of goods and provision of services.

Linkages

It is proposed that the indicators in the economic activity category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Equity, education (skill level) health, quality of life, consumption
Environmental:
Vehicle emissions, natural resource depletion, natural resource stocks, farming of marginal agricultural lands, water use, waste management
Economic:
Diversity of trade products and partners, employment, consumption, basic services, infrastructure spending

What Do You think?

As you read and discuss the economic activity category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

13.1 Issue: Economic Performance

This issue highlights productivity and the efficient use of resources for production. Sustainable economic development is essential for the health and well-being of our population and protection of our natural resources for future generations. This issue links strongly to consumption, waste and emissions. ***The Gross Domestic Product (GDP)*** should be viewed in the context of equity and market imperfection issues, which are more completely captured in the category on equity and rights. The final indicator(s) for this issue should give us an overall picture of the state of the province's economic activity as a whole, tying in specific information from mining, forestry, agriculture, fishing and energy. They should also tell us whether we are creating and maintaining an environment for cutting edge, sustainable, competitive businesses to flourish.

Proposed Indicators

13.1 (a) Real GDP per capita growth rate. This indicator factors the ***inflation rate*** into the GDP, so that if the GDP goes up it is reflecting a true increase in the province's productivity, and not just the inflation of our dollar. It would be presented per capita, to ensure comparability with other provinces with higher or lower populations. Information would also be presented by industry sector. The GDP is a measure of money exchanging hands, and does not account for services such as volunteer work, caring for children and the value of leisure time, and ignores the depletion of natural resources used to produce goods and services. Thus the GDP is not necessarily a reflection of a society's well-being. The limitations of the GDP would be discussed in the analysis of the data.

13.1 (b) Companies integrating sustainable development. This indicator would track the number of companies using environmental or sustainable development codes of practice, environmental management systems or ***ISO 14000*** in their day-to-day operations, expressed as a percentage of companies that report publicly. Codes of practice and international standards such as ISO 14000 are voluntary initiatives that focus on minimizing adverse effects of operations and products on employees, customers, the public and the environment. This indicator would not reflect businesses who do not publicly report on their processes.

Data Availability

Real GDP per capita growth rate: Data available from Manitoba Bureau of Statistics; collected from 1971 - present; available on an annual and quarterly basis.
Companies integrating sustainable development: Data available from Manitoba Industry, Trade and Mines; available on an annual basis.

14.0 DEMOGRAPHICS

The demographics category deals with the composition and dynamics of Manitoba's population.

Linkages

It is proposed that the indicators in the demographics category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Culture and heritage, quality and traditional way of life, determinants of health, health services, crime rate, perceived safety/fear of crime
Environmental:
Stresses on natural resources, water quantity and quality, air quality
Economic:
Economic activity, employment, education, provision of basic services, land use and human settlement

What Do You Think?

As you read and discuss the demographics category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

14.1 Issue: Population Trends

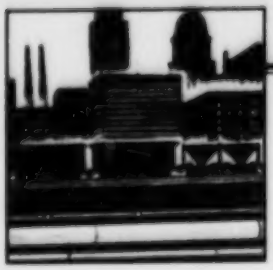
Manitoba's population is relatively stable. Migration out of the province and low levels of immigration contribute to this stability. In the last two decades, urban migration has resulted in decreasing populations in rural and northern Manitoba and increasing populations in urban centres, especially Winnipeg and its surrounding areas. This is especially true for the province's Aboriginal population, which is one of our fastest growing populations within which rapid urban migration has occurred. Another important factor in our population structure is age. With the exception of the Aboriginal population, our life expectancy is increasing and we are having fewer children. The result is a larger number of elderly who may be more dependent on pension and health care systems and who may impact on our ability to fill jobs. Tracking the structure, dynamics and increase or decrease of Manitoba's population would help to determine the effect of a changing population on particular social, health, economic and environmental conditions. The final indicator(s) for this issue should give us an overall picture of the changes in number, location and composition of the population. Over time, we should be able to link population changes to various trends, such as increased pressure on resources, changes in economic activity, and health of communities.

Proposed Indicator

14.1 (a) Population Index. This index would include rates of births and deaths, male and female population by age, population increases or decreases by year, rural and urban population ratios and immigration versus emigration. If possible, trends specific to Aboriginal populations will be highlighted. Age composition of Manitoba population would also be examined. This information should give context and help us analyze trends in all other categories.

Data Availability

Population Index: Data available from multiple sources; (1) Manitoba Bureau of Statistics; collected from 1961 - present; available on a monthly and annual basis. (2) Statistics Canada; collected from 1870 - present; available on an annual basis.



15.0 Basic Services

The basic services category deals with the availability and condition of water, waste and transportation infrastructure and services.

Linkages

It is proposed that the indicators in the basic services category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Equitable access, community and culture, governance, health
Environmental:
Natural lands and protected areas, forest protection and forest harvest and use, air quality, leachate, methane emissions, aggregate mining resource, water quality
Economic:
Mobility, land use and human settlement, economic activity, energy use

What Do You Think?

As you read and discuss the basic services category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

15.1 Issue: Infrastructure Availability and Condition

Infrastructure is a broad term referring to physical structures that form the foundation for development. The type of infrastructure required depends on the type of development. For our purposes, infrastructure refers to water and wastewater treatment facilities, facilities to manage solid waste, transportation infrastructure such as roads and airports, and systems such as mass transit. Clean and safe water supplies and proper sewage treatment allow citizens to have healthy living conditions. A safe, adequate and efficient transportation infrastructure enables economic growth and performance. Therefore, the infrastructure condition and level of service it provides have a great bearing on the production costs and market accessibility. However, the costs of providing water, waste and transportation infrastructure are straining available government financial resources. Funding constraints have resulted in deteriorating infrastructure and repair costs are high. In northern regions, all-weather access to isolated communities is limited. As well, some isolated communities do not have access to safe water supplies. Natural gas and telecommunications service delivery to specific regions of the province is also an issue. The final indicator(s) for this issue should give us an overall picture of the state and availability of infrastructure in the province.

Proposed Indicator

15.1 (a) Population with adequate infrastructure. This measure would provide information on communities with adequate water and wastewater facilities, municipal recycling, regional landfills, hazardous waste facilities, and transportation infrastructure. The percentage of the communities that have access to each or all of these types of infrastructure would be presented, with a focus on northern Manitoba.

Data Availability

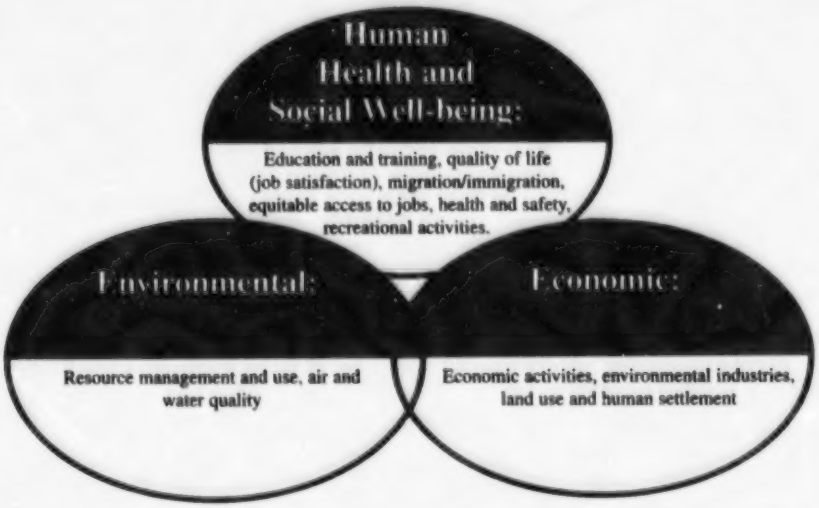
Population with adequate infrastructure: Data available from multiple sources: (1) Manitoba Conservation; available on a varied frequency;
(2) Manitoba Highways and Government Services; collected from 1979 - present; available on an annual basis.

16.0 EMPLOYMENT

The employment category deals with the number of people employed in full and part time jobs and the value of work as measured by time and skill.

Linkages

It is proposed that the indicators in the employment category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Education and training, quality of life (job satisfaction), migration/immigration, equitable access to jobs, health and safety, recreational activities.
Environmental:
Resource management and use, air and water quality
Economic:
Economic activities, environmental industries, land use and human settlement

What Do You Think?

As you read and discuss the employment category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

16.1 Issue: The Labour Force

This issue addresses whether or not we are meeting the labour needs of current businesses, and attracting new businesses. A knowledgeable, well-trained and experienced workforce is critical to meeting employers' needs. Varied and diverse job opportunities are necessary to meet workers' needs. Both are key to a healthy economy. The final indicator(s) for this issue should give us an overall picture of the level and composition of employment and unemployment in the province. This will allow us to determine whether there is a diversity of job opportunities, equitable access to these opportunities, and a labour force that meets the needs of businesses located in the province.

Proposed Indicator

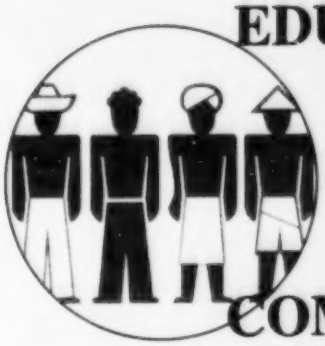
16.1 (a) Labour force index. This index would present three measures: employment to population ratio (the number of people aged 15 and over compared to total population), labour force participation rate (number of "employable" people in the population 15 years and older who are participating in the labour force), and unemployment rate. Where possible, differences in age group, region, gender, Aboriginal status and occupation will be highlighted. ***Self-employed*** workers and ***unpaid family workers*** are included in the labour force participation rate. Information on visible minority groups in the workforce and ***disguised unemployment*** is currently unavailable. This indicator would tell us which portions of the population are, or are not, gaining employment, the type of work in which they are engaged, and the diversity of job opportunities available.

Data Availability

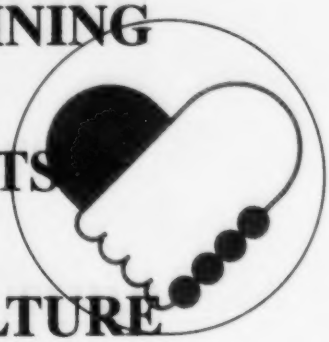
Labour force index: Data available from multiple sources; (1) Statistics Canada; collected from 1970's - present; available every five years, monthly and annually. (2) Department of Indian Affairs and Northern Development; collected from 1981 - present; available on an annual basis.

HUMAN HEALTH AND SOCIAL WELL-BEING DIMENSION

EDUCATION AND TRAINING



EQUITY AND RIGHTS



COMMUNITY AND CULTURE

GOVERNANCE

HEALTH

JUSTICE

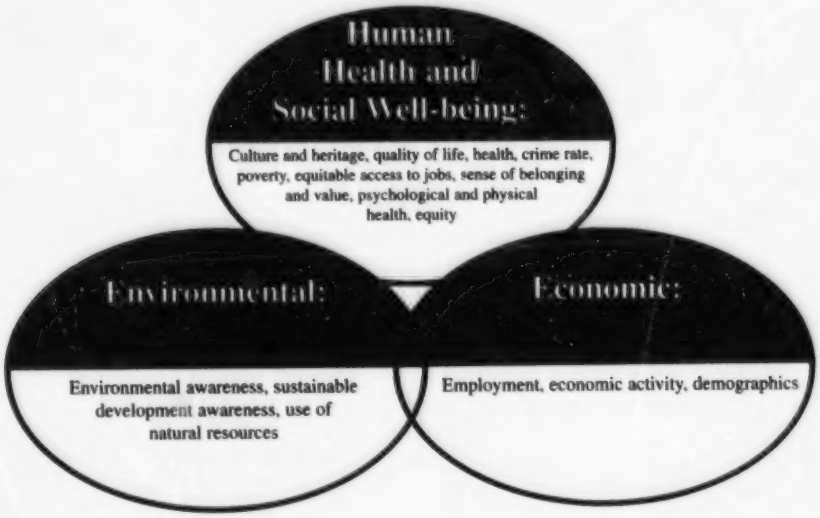
PERCEIVED QUALITY OF LIFE

17.0 Education and Training

The education and training category deals with the quality and effectiveness of education and training.

Linkages

It is proposed that the indicators in the education and training category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction


Human Health and Social Well-being:
Culture and heritage, quality of life, health, crime rate, poverty, equitable access to jobs, sense of belonging and value, psychological and physical health, equity
Environmental:
Environmental awareness, sustainable development awareness, use of natural resources
Economic:
Employment, economic activity, demographics

What Do You Think?

As you read and discuss the education and training category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

17.1 Issue: Quality and Effectiveness of Education and Training

A well-educated population is a basic component of sustainable development. People cannot make informed decisions unless they have adequate information and the capability to analyze that information. It is important to track how well education and training systems are functioning to determine whether they are meeting the demands of society. Information and education are key to the knowledge, skills and values we need to make direct connections between every day activities and sustainability issues. The final indicator(s) for this issue should give us an overall picture of the quality, affordability and effectiveness of education and training. Aboriginal issues will be highlighted if possible.

Proposed Indicators

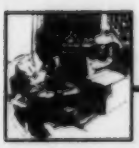
17.1 (a) Literacy rate. This indicator refers to the proportion of the population that has the ability to understand and use printed information in daily activities at home, at work and in the community, to achieve one's goals and to develop one's knowledge potential. It includes capability to understand texts, various types of documents and arithmetic operations. It rates the population's level of literacy on a scale from one to five, one being low and five being high. A rating of three is considered literate. Low levels of literacy affect an individual's ability to find a job and to perform well in that job, and are likely to lead to lower paying jobs, reinforcing inequities that may have contributed to the low literacy skills in the first place. Literacy levels also have an impact on an individual's ability to participate in society and culture. Assessing literacy offers a measure of the effectiveness of education systems.

17.1 (b) Graduation Rate. This indicator measures the number of students graduating from high school as a percentage of the total population. If possible, the analysis of this indicator would examine graduate follow-up, meaning whether students obtained a job in the field they trained for, whether or not that job was in Manitoba and the salary. This would provide information on whether graduates are able to live and work in Manitoba in their chosen fields, or whether they are attracted elsewhere by better jobs and salaries, i.e. ***brain drain***.

17.1 (c) Student achievement. This indicator would provide information on the results of provincial tests and national assessments. It is not agreed whether these tests and assessments are an adequate reflection of scholastic achievement, and knowledge obtained. Care will need to be taken in interpreting the test results.

Data Availability

Literacy rate: International Adult Literacy Survey (IALS) data collected by Statistics Canada in 1996, likely to be repeated in 2002. Currently only available on a regional level (Western Canada). Manitoba specific data could be obtained at a cost.
Graduation rate: Data available from Manitoba Education and Training and Statistics Canada; collected from 1986 - present; available on an annual basis.
Student achievement: Data available from multiple sources; (1) Manitoba Education and Training; collected from1995 - present; available on an annual basis. (2) Council of Ministers of Education; collected from School Achievement Indicators Program; 1993 - present; available on an annual basis.

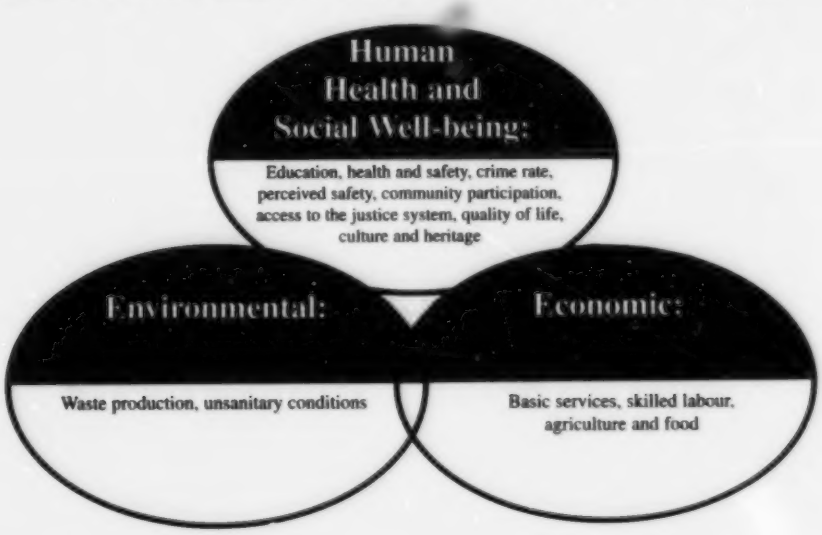


18.0 Equity and Rights

The equity and rights category deals with social justice and human rights for all, including fairness and equitable living.

Linkages

It is proposed that the indicators in the equity and rights category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Education, health and safety, crime rate, perceived safety, community participation, access to the justice system, quality of life, culture and heritage
Environmental:
Waste production, unsanitary conditions
Economic:
Basic services, skilled labour, agriculture and food

What Do You Think?

As you read and discuss the equity and rights category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

18.1 Issue: Human Rights and Social Equity for Individuals, Groups and Communities

The equality of all people is basic to the concept of sustainable development. So is the ability to provide the necessities of life and have access to opportunities offered by society. In *Our Common Future,* The World Commission on Environment and Development stresses the importance of inter-generational and community equity. This issue addresses people who are economically disadvantaged, have physical or mental disabilities or illnesses, or are unable to participate fully in society due to economic circumstances or bias toward their particular group. All Manitobans have a right to access goods, services and opportunities. The final indicator(s) for this issue should give us an overall picture of how tolerant and inclusive our society is and whether opportunities are available and extended to all our citizens. Aboriginal issues are a particular focus here.

Proposed Indicators

18.1 (a) Income distribution and dependency. This indicator would provide information on the average annual or weekly income by ethnic group, gender and family group. It would include information on the proportion of the population that relies on government sources of income rather than earned income for their food and shelter needs. Government sources of income include pension, employment insurance and welfare. Child poverty would be examined in the analysis of this indicator.

18.1 (b) Labour force composition. This indicator would provide information on the type of positions held by persons belonging to target groups to help determine whether all people have access to employment opportunities. The population would be presented by selected demographic and socio-economic characteristics, showing minority subgroups with respect to male/female proportion of the labour force, activity by industry divisions and by occupation. The Manitoba Human Rights Code does not allow employers to reject applicants for jobs on the basis of physical characteristics, unless an employer can prove that such requirements are necessary for the performance of the job. ***Systemic discrimination*** would be reflected through the absence or low representation of demographic groups of Manitobans in each employment position level.

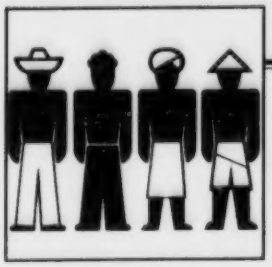
18.1 (c) Adequate, suitable and affordable housing. This indicator would track the number of households experiencing one or more of the core housing problems: adequacy, suitability and affordability. Adequacy determines if a household's dwelling is in need of major repair or is lacking basic facilities. Suitability determines if a dwelling is a sufficient size to accommodate a household. Affordability determines if a household's basic shelter costs exceed 30% of the gross household income. Homelessness in Manitoba would be discussed, although tracking actual numbers of homeless people is difficult.

18.1 (d) Access to nutritious food. This indicator would track availability and cost of nutritious food. It would also look at people's diets to determine whether people are properly educated about nutrition and health benefits. This indicator has a strong linkage to determinants of health. There is currently no established measurement for this indicator.

18.1 (e) Equitable access for persons with disabilities. This indicator would provide information on the availability of transportation, technical aids, services and facilities for people with disabilities. The indicator would be expressed by type of disability and the range of specialized goods and services available. Discrimination on the basis of physical and mental disability is prohibited in the Manitoba Human Rights Code.

Data Availability

Income distribution and dependency: Data available from multiple sources; (1) Statistics Canada; collected from 1986 - present; available on an annual basis. (2) Manitoba Bureau of Statistics; collected from 1972 - present; available on a quarterly or annual basis. Income dependency: Data available from Statistics Canada; collected from 1961 - present; available on an annual basis.
Labour force composition: Data available from Statistics Canada; collected from 1970's - present; available on an annual basis.
Adequate, suitable and affordable housing: Data available from CMHA; available every five years.
Access to nutritious food: Data currently not available.
Equitable access for persons with disabilities: Data available from multiple sources; (1) Statistics Canada; collected from 1981 - present; available every five years. (2) Society for Manitobans with Disabilities; collected from 1994 - present; available on a varied frequency.



19.0 Community and Culture

The community and culture category deals with the opportunity to belong to a community and share its beliefs and culture.

Linkages

It is proposed that the indicators in the community and culture category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.

Human Health and Social Well-being:
Health and safety, education, quality of life, crime rate, human rights, social equity.
Environmental:
Community environmental organizations, environmental preservation
Economic:
Economic activities, employment

What Do You Think?

As you read and discuss the community and culture category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

19.1 Issue: Community Participation

Beyond putting something back into a community, the quality of life, health and safety benefits of participating in community life are wide spread. Tracking the availability of and access to community organizations and the level of participation and volunteerism within those organizations would provide a picture of the relative sense of community found in regions of the province.

Proposed Indicator

19.1 (a) Participation rates of community organizations, including volunteer work. The number and level of participation in community organizations is currently not tracked. A proxy measure could be the number of Healthy Communities organizations, Community Round Tables and community clubs, by region. Augmented by information on volunteer work (average and total volunteer hours worked and type of volunteer activities), a picture of community participation rates should emerge. Measuring participation and sense of community and belonging is difficult, and there is no commonly agreed upon method. Community club information may only be available for the City of Winnipeg.

19.2 Issue: Preservation of Heritage and Culture

Languages and tradition are the backbone of culture. Preserving them is fundamental to a healthy, thriving community. Sharing and sustaining heritage and culture provides opportunities for understanding and fellowship, and is an important link with the past. Remembering traditions and spiritual values help people connect to their culture and develop their sense of identity and pride in themselves and the accomplishments of their ancestors. This further enhances well-being and commitment to community.

Proposed Indicator

19.2 (a) Primary language spoken at home. This indicator would be expressed by type of language and the percentage of the population speaking that language. Tracking this information over time will alert us to the possibility of losing a heritage language. Heritage language programs in the province will also be discussed. Preserving heritage languages helps people learn from the history and traditions of others, and helps to preserve diverse cultures. This would serve as a proxy measure for the preservation of culture and heritage, although it is understood there is far more to a culture than the associated language.

Data Availability

Participation rates of community organizations, including volunteer work: Data on community organizations is available from Manitoba Healthy Communities Network and Manitoba Intergovernmental Affairs collected from 1990's - present; available on an annual basis. Data for participation in community clubs is unavailable at this time. Data for volunteer work is available from Statistics Canada; collected from 1987 - present; available every ten years.

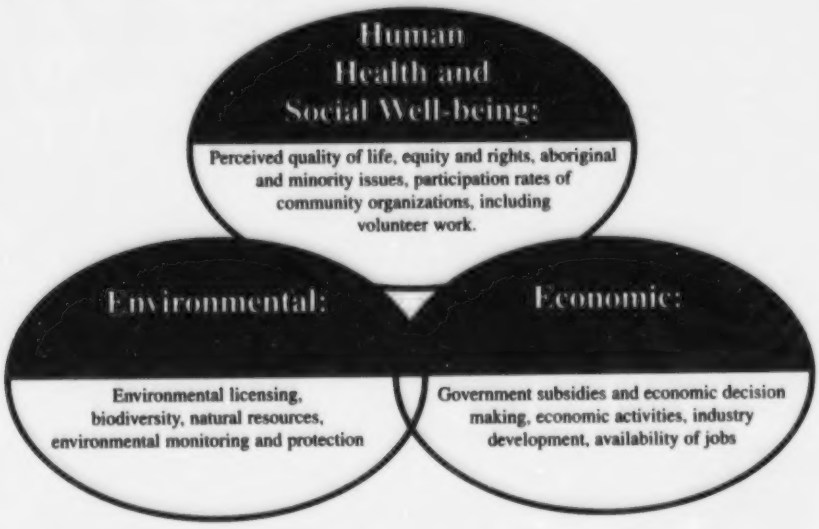
Primary language spoken at home: Data available from Statistics Canada; collected from 1951 - present; available every five years.

20.0 GOVERNANCE

The governance category deals with the effectiveness of leadership and management of provincial affairs, institutional guarantees for participation in decision-making, and accountability of institutions and officials, both elected and appointed.

Linkages

It is proposed that the indicators in the governance category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Perceived quality of life, equity and rights, aboriginal and minority issues, participation rates of community organizations, including volunteer work.
Environmental:
Environmental licensing, biodiversity, natural resources, environmental monitoring and protection
Economic:
Government subsidies and economic decision making, economic activities, industry development, availability of jobs

What Do You Think?

As you read and discuss the governance category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

20.1 Issue: Opportunity for Participation and Redress

Public participation can take many forms, including voting in elections. The indicators should illustrate the capacity of our government structure to provide information, enable public participation, and enhance flexible, community based and holistic decision-making. People must believe that they can make a difference and understand how they can participate to enable integration of grassroots knowledge into decision-making. People must have avenues for redress if they feel they have not been adequately represented by their government. This is reflected, in part, through voting rates.

Proposed Indicator

20.1 (a) Voting rates. This indicator would compare the number of people who voted in municipal, provincial and federal elections against the total number of eligible voters. Information would be presented by constituency or federal riding, as well as by population demographics, if available. When people exercise their right to vote it indicates satisfaction with the representative democratic system, and the feeling that voting can make a difference. This is an internationally agreed upon measurement of democratic opportunity for participation and redress. However, it does not take into consideration grassroots public participation, holistic decision making, or the integration of traditional knowledge in decision making processes.

20.2 Issue: Fiscal Accountability

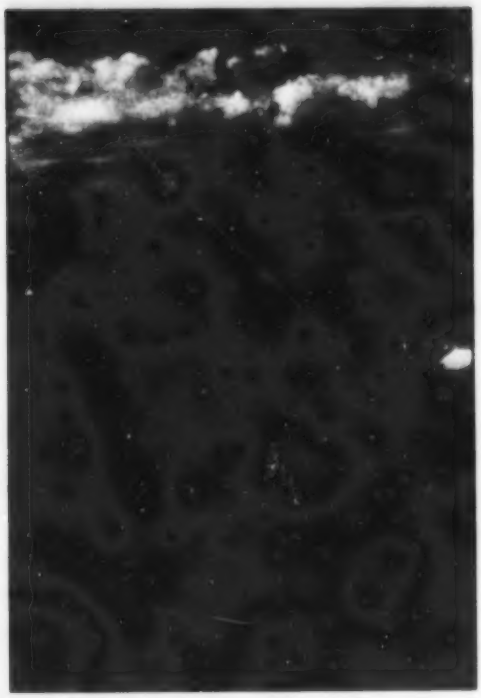
The challenge of sustainable development is to be able to live within our means, instead of borrowing and leaving debt for future generations. Within government, this means jurisdictions can no longer live on credit and must exercise responsible public spending. Most governments are focussing on making operations more efficient and effective. The elimination of operating deficits has been a priority for most governments over the past few years. Now efforts are shifting toward tackling the debt that has built up over several decades. The information on fiscal accountability would tell us how government is managing its resources. The final indicator(s) for this issue should give us an overall picture of the effectiveness and efficiency of government operations.

Proposed Indicator

20.2 (a) Fiscal Accountability. This indicator would provide a comparison between provincial revenues and expenditures, in relation to provincial debt (money the province owes). It would examine the cost of paying interest on the debt and how much of our long-term debt is paid down each year. It would also discuss budget allocations for the priorities of government.

Data Availability

Voting rates: Data available from multiple sources; (1) Elections Manitoba; collected from 1870 - present; available every provincial election. (2) Elections Canada; collected from 1800's - present; available every federal election. (3) Chief Electoral Officer of Canada; collected from 1984 - present; available every federal election.
Fiscal Accountability: Data available from Manitoba Finance; collected from 1940's - present; available on a quarterly and annual basis.

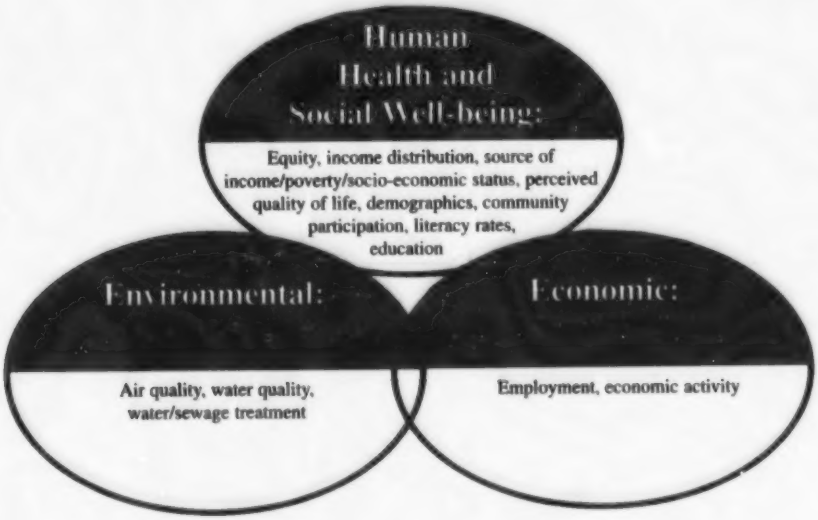


21.0 HEALTH

The health category deals with the mental, physical, spiritual and social well-being of Manitobans.

Linkages

It is proposed that the indicators in the health category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Equity, income distribution, source of income/poverty/socio-economic status, perceived quality of life, demographics, community participation, literacy rates, education
Environmental:
Air quality, water quality, water/sewage treatment
Economic:
Employment, economic activity

What Do You Think?

As you read and discuss the health category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issues?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

21.1 Issue: Determinants of Health

The determinants of health are the key factors influencing health. They include healthy child development, personal health practices and coping skills, physical environment, employment/working conditions, education, income/socio-economic status, biology and genetic endowment, and access to quality health care services. The special needs of Aboriginal people will be highlighted under this issue, if possible. Although they have made significant gains in health in recent years, Aboriginal people remain among the most disadvantaged of our citizens and have the poorest overall health. Manitobans face a wide range of choices and circumstances that affect their health. The lifestyle choices people make impact directly on their health. Circumstances can limit people's capability to maintain a healthy lifestyle. Some determinants of health, such as physical environment, employment/working conditions, education, income/socio-economic status are discussed in more detail under other categories of the workbook, with linkages made to health.

Proposed Indicators

21.1 (a) Readiness to Learn. This indicator measures a child's readiness to learn at school in five general domains - physical health and well-being, social competence, emotional maturity, language richness and general knowledge and cognitive skills. The four to five year old age group is studied. The measure is designed to provide information for groups of children in order to assess strengths and weaknesses in students, assess effectiveness of early childhood interventions and predict how children will perform in elementary school. This indicator addresses healthy child development.

21.1 (b) Healthy life choices index. This indicator addresses personal health practices and would provide information on choices people make regarding their health. It would possibly include choices made regarding such things as smoking, drinking, obesity and physical activity level. These data are presently being collected individually and an index has yet to be developed.

21.1 (c) Access to health services. This indicator would provide information on access to health services in the province, based on measures such as length of wait for medical and diagnostic services. Although this may not be the best measure of access to health services, it is the most understood and the data is available.

21.2 Issue: Population Health Status

The health of a population is determined by tracking the level of general health and well-being, the ability to function, the existence of disease or health problems, causes of death and length of life. Demographic differences may mean differences in individual health status. Within the Aboriginal population, for example, substantial differences are seen from the rest of Manitoba's population. Living and working conditions, such as income, education level and employment are closely related to each other and to the range of factors that influence health. Poor health early in life can mean poor health throughout life, increasing the burden on the health care system and preventing individuals from reaching their potential. Therefore, programs to promote child health and prevent disease in children have been a focus for health and social agencies in the province. Ensuring that children get a healthy start in life is important to the long-term health and economic viability of a society. The final indicator(s) for this issue should give us an overall picture of the different health problems that may be affecting Manitobans, young and old, and possible reasons or lifestyle choices that are causing these trends.

Proposed Indicators

21.2 (a) Potential years of life lost (PYLL). This indicator would measure the total years of life lost before age 75 by major causes of death and by age group. Unlike other mortality data which counts all deaths as an equal unit regardless of age at death, PYLL measurements only consider deaths before age 75 and weights them by age. This allows for comparison of death occurrence and causes by their impact on "premature death."

21.2 (b) Infant mortality rate. This indicator would provide information on the level of mortality, health status and level of health care in the province, as well as effectiveness of preventive care and attention paid to the health of the mother and her child. It is a ratio of the deaths among infants under one year old to the number of live births, for a given period of time.

21.2 (c) Ability to Function. This indicator would provide information on the number of people in the province who have ongoing health needs. It is derived from responses to questions on long term activity limitation, disability days and perfect health. Long term activity limitation is defined as any limitation of disability on normal activities, at home, school or work. Perfect health is based on eight attributes: vision, hearing, speech, mobility, dexterity, cognition, emotion, and pain/discomfort.

The study does not include peoples living on reserves, and the numbers may be too small to report at a regional level due to the categorical breakdown of questions. This indicator is reliant on the National Population Health Survey (NPHS) for data. Not all NPHS questions are followed through with consecutive surveys, so this indicator may not be calculated if the survey is used.

Data Availability

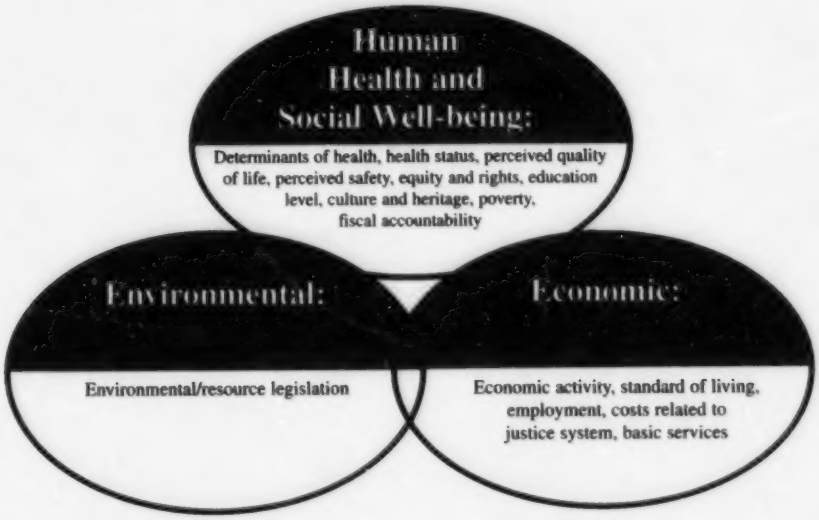
Readiness to Learn: Data available from Children and Youth Secretariat.
Healthy life choices index: Data available from Manitoba Health.
Access to health services: Data available from Manitoba Health.
Potential years of life lost: Data available from Manitoba Health and Vital Statistics.
Infant mortality rates: Data available from Manitoba Health; collected from 1992 - present; available on an annual basis.
Ability to Function: Data available from National Population Health Survey, 1996.

22.0 JUSTICE

The justice category deals with the security of individuals, and the systems necessary to protect them.

Linkages

It is proposed that the indicators in the justice category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
Determinants of health, health status, perceived quality of life, perceived safety, equity and rights, education level, culture and heritage, poverty, fiscal accountability
Environmental:
Environmental/resource legislation
Economic:
Economic activity, standard of living, employment, costs related to justice system, basic services

What Do You Think?

As you read and discuss the justice category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, do the proposed indicators sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

22.1 Issue: Effectiveness of the Justice System

Efficiency, effectiveness and accessibility are key to the justice system. The ideal system provides not only for punishment of offences, but also for rehabilitation of offenders. It is important to track how well our justice system meets this description and where it falls short. The main obstacles to accessing the justice system are affordability and geographic access to libraries, lawyers, courtrooms and language translation services. The final indicator(s) for this issue should give us an overall picture of whether the criminal justice system is reducing crimes, particularly by repeat offenders.

Proposed Indicators

22.1 (a) Crime rate. This information would be presented by type of crime to persons or property. Spousal and child abuse and homophobic and other hate-related crimes would be discussed here, as would gang-related activities. It should be noted however, that there are a number of limitations with using crime rate as a measure of effectiveness of the justice system. Criminal justice policy may result in more crimes being reported, therefore causing the crime rate to rise. A multitude of social factors such as gender, age, socio-economic status, race, urbanization and mobility of populations also influence the amount of crime in the province. Some types of crimes have a high incidence of being unreported, and information is gathered on some types of crimes more than others. It is proposed that crime rate be used as a general indicator of criminal activity and be analyzed in conjunction with information on re-offender rates, victimization and public perception of safety (found in perceived quality of life category) to give a more complete picture of the effectiveness of the criminal justice system.

22.1 (b) Re-offending rate. This indicator measures the re-offending rate of those who have served a sentence. Re-offending can be defined in many ways, including a new arrest, a new conviction or a new sentence. None of these definitions, however, can account for the individual who has returned to criminal activity, but has not been detected by the criminal justice system. Manitoba Justice is participating in discussions with other Canadian jurisdictions to formulate a common definition of re-offending. Collection of data will commence once agreement among jurisdictions is reached.

22.1 (c) Victimization. This indicator would tell us the percentage of the population who were victims of a crime and circumstances of the crime. Studies have shown that more than half of criminal incidents are never brought to the attention of the police.

Data Availability

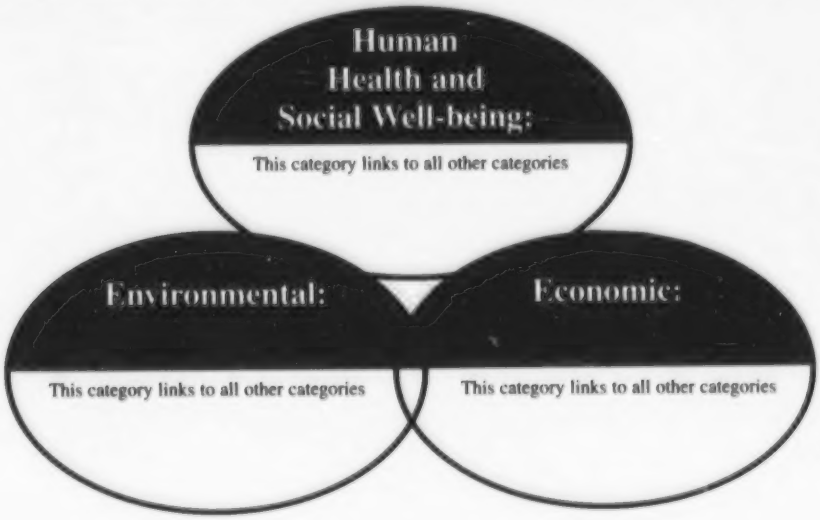
Crime rate: Data available from multiple sources; (1) Winnipeg Police Service; collected from 1970's - present; available on an annual basis. (2) Royal Canadian Mounted Police; collected from 1900's - present; available on an annual basis. (3) Statistics Canada; collected from 1981 - present; available on an annual basis.
Re-offending Rate: No data currently available; will be collected once definition agreed on.
Victimization: Survey has been done by Statistics Canada; uncertain as to the date and frequency.

23.0 Perceived Quality of Life

The perceived quality of life category deals with questions related to how people perceive their quality of life, as individuals and within their communities.

Linkages

It is proposed that the indicators in the perceived quality of life category have interdependencies to and/or impacts on many other issues discussed in the workbook. The linkages are presented here, grouped within the three dimensions of the indicator framework discussed in the introduction.


Human Health and Social Well-being:
This category links to all other categories
Environmental:
This category links to all other categories
Economic:
This category links to all other categories

What Do You Think?

As you read and discuss the perceived quality of life category, please keep the following questions in mind. Your feedback on these questions is needed to help refine and improve the indicator set.

- **Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba?**
- **Given the indicator selection criteria, does the proposed indicator sufficiently address the issue?**
- **Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why?**
- **Do you have other comments on this category?**

23.1 Issue: Satisfaction With Life

A person's quality of life influences his or her happiness and ability to contribute to society. How people feel about themselves and their particular circumstances affects how they feel about society and whether they will participate fully. ***Qualitative*** surveys repeated over time would display a trend in Manitobans' perception of their overall quality of life. Together with the ***quantitative*** indicators presented throughout, we should have a picture of the relative quality of life in the province.

Proposed Indicator

23.1 (a) Perceived quality of life. This indicator would entail a compilation of qualitative survey questions directed toward a representative sampling of Manitobans. The following subject areas would be covered:

- Level of satisfaction with employment
- Perceived ability to influence decision-making
- Perceived safety / fear of crime
- Satisfaction with the justice system
- Satisfaction with the health system
- Satisfaction with the public education system
- Psychological well-being
- Perception of Manitoba as a good place to live, work and raise children

Data Availability

Level of satisfaction with employment: Survey to be developed
Perceived ability to influence decision-making: Survey to be developed
Perceived safety / fear of crime: Survey to be developed
Satisfaction with the justice system: Survey to be developed
Satisfaction with the health system: Survey to be developed
Satisfaction with the public education system: Survey to be developed
Psychological well-being: Sense of Coherence Scale (National Population Health Survey. See limitations around NPHS data in Ability to Function indicator.)
Perception of Manitoba as a good place to live, work and raise children: Survey to be developed

GLOSSARY

Acid precipitation: (also known as acid rain, acid deposition) Rain, snow or fog with a pH of less than 5.6. Acid precipitation is often caused by air-borne sulphur (SO_2) and nitrogen oxides (NOx) reacting with moisture, to eventually form sulphuric and nitric acids. These acid causing compounds may fall as rain, snow, or fog or they may be deposited in dry form. Acid precipitation can harm aquatic ecosystems and kill freshwater fish. As well, it can damage trees and plants, and gradually erode stone, metal and other surfaces.

Annual allowable cut (AAC): The volume of wood that may be harvested, under management, for one year. The provincial AAC is the total volume that can be harvested in Manitoba in a given year based on sustained yield principles.

Aquatic nuisance species: See exotic nuisance species.

Baseline: An initial data point (or collection of data points) against which all future data points will be compared to determine a trend.

Biodiversity (biological diversity): A broad term referring to the variety of life in an area from small areas such as a pond to the whole biosphere. Biodiversity encompasses four main considerations: landscape diversity, ecosystem diversity, species diversity and genetic diversity. It also involves the countless, complex ways in which living things function and interact.

Biomass: The amount of living substance on a population or a system, usually measured in units such as wet weight, dry weight, ash-free weight, and nitrogen content. The term biomass is interchangeable with the term standing crop. In general, biomass (wood, vegetation and crop residue) is burned either for disposal or to produce energy or it is left on the site to decompose. The productivity of biomass is usually measured in units such as weight per year. The basis of renewable resource sustainability is the biomass and productivity relationship.

Brain drain: The movement of persons with scientific or technical knowledge, skills or experience from one country (or province or locality) to another.

Carrying capacity: In ecology, the carrying capacity of the environment refers to the maximum number of plants or animals that a particular area can support. It can be applied to communities as well as individual species. When the carrying capacity is exceeded, there are insufficient natural resources to sustain the population, which may then be reduced by emigration, reproductive failure, or death through starvation, thirst or disease. Most species oscillate in number, fluctuating just above and just below the carrying capacity of the environment. Some, such as lemmings and snowshoe hares, show a massive increase in numbers, far in excess of the carrying capacity, followed by a catastrophic reduction caused by mass starvation or the adoption of behaviour patterns which result in mass fatalities.

Chlorofluorocarbons (CFCs): Gaseous synthetic substances composed of chlorine, fluorine and carbon. They have been used as refrigerants, as aerosol propellants, as cleaning solvents, and in the manufacture of plastic foam. CFCs are suspected of causing ozone depletion in the stratosphere.

Climate change (global warming): The warming of the earth and its atmosphere by the enhanced greenhouse effect. Global warming is expected to lead to global climate change. The Intergovernmental Panel on Climate Change predicts by 2025 the planet will be about one degree Celsius warmer than it is now, and three degrees Celsius higher by the end of the 21st century. To put these figures into perspective, the earth's average temperature during the last ice age was only five degrees Celsius colder than at present.

Conservation: The process through which natural resources are managed to allow partial or total exploitation, for individual, community or commercial use, without in any way jeopardising the long-term viability of the resource base or inflicting undue or excessive environmental damage. Conservation encompasses full consideration of the varying requirements of the local human population, together with those of the wildlife species or habitat to be conserved, including an appreciation of the ability of each to adapt to any changes. It is distinguished from 'preservation', which is considered to be the maintaining of the pristine state of nature as it is or might have been before the intervention of either human or natural forces.

Consumption: Spending by consumers, individually or in groups, on goods and services. Consumption consists of private spending on goods and services such as food, houses, furniture and clothing, and public spending on such services as health, education and welfare. Spending on capital expenditures, such as factories machinery, engineering and geological services is not usually included.

Crown lands: Public lands held by the government of Manitoba.

Disguised unemployment: Forms of unemployment that do not show up in official unemployment statistics. The standard definition and measure of unemployment (people who are unemployed and looking for work) does not capture some information which can be considered important in getting a complete picture of the complexity of unemployment. This might include information on people who have given up looking for work ("discouraged workers") and those who are employed only part-time because they haven't been able to obtain full-time employment. It might also include information on length of unemployment given that, while all would be "unemployed," the severity of impacts would be different.

Ecological Footprint: The corresponding area of productive land and aquatic ecosystems required to produce the resources used and to assimilate the wastes produced, by a defined population at a specified material standard of living, wherever on Earth that land may be located.

Ecological integrity: Natural, unmanaged or managed ecosystem quality in which the natural ecological processes are sustained so that genetic, species, and ecosystem diversity is assured for the future.

Ecosystem: An integrated system of living species, their habitat, and the processes that affect them.

Ecotourism: A brand of nature tourism that promotes conservation and supports sustainable development.

Ecozone: A large, terrestrial ecosystem unit that contains distinctive sets of non-living and living resources that are ecologically related as a system.

Endangered species: A species indigenous to Manitoba, which is threatened with imminent ***extinction*** or with ***extirpation*** throughout all or a significant portion of its Manitoba range.

Enduring features: All plant and animal species that live in Manitoba share a connection to the landscapes in which they are found. For this reason, each natural region has been divided into smaller areas, based on soils and landform. Unlike plants and animals, soils and landforms are more stable over time and are often called enduring features. Representing enduring features in a system of protected lands serves as a useful way to protect the biological diversity for a natural region. Analysis of enduring features identifies the different combinations of soils and landforms and determines if they are adequately protected in Manitoba's network of protected areas.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Eutrophication (nutrient enrichment): The process by which bodies of water become better nourished by fertilization. This process is often accelerated by nutrient-rich discharges from agriculture or sewage, leading to a rapid and excessive growth of algae and water plants and undesirable changes in water quality.

Exotic nuisance species: Organisms introduced into habitat where they are not native and have been intentionally introduced or have inadvertently infiltrated an area.

Extinction: The complete disappearance of a species of plant or animal from the planet. It is a natural biological phenomenon and is part of the process of evolution. Over 90 percent of all species that have ever lived have disappeared. Mass extinctions have happened in the past, but the rising pace of extinctions is due solely to human activities such as increasing levels of pollution, hunting or habitat destruction. Historically, extinctions, even 'mass extinctions', were lengthy processes - the dinosaurs disappeared over a period of 2 million years. Today, species are being lost in a matter of centuries, and some in a much shorter time span.

Extirpation: Refers to an official designation assigned by the Committee on the Status of Endangered Wildlife in Canada. The designation is assigned to any indigenous species or subspecies or geographically separate population of plants or animals no longer known to exist in the wild in Manitoba, but existing in other parts of Canada or the world.

Geothermal: Ground source heating and cooling. Geothermal heat pump systems use no fuel, instead they move heat from the earth into a building, or from a building back into the earth. A small amount of electricity is used to operate the pumps, fans, controls and small refrigerator-like compressor, which along with the heat exchangers are the major components.

Greenhouse gases (emission and mitigation): Gases in the earth's atmosphere that cause global warming (and thus, climate change). Examples are carbon dioxide (the most important greenhouse gas), chloroflourocarbons, ozone, methane and nitrous oxide. Emissions are the release of gases considered to contribute to the greenhouse effect, and mitigation is the reduction of the release of these gases.

Gross Domestic Product (GDP): The value of production of goods and services in the economy resulting from the factors of production, in particular from capital, whether of Canadians or non-residents. It does not include the returns from Canadian investment abroad, but does include the returns on foreign capital invested in Canada.

Habitat: The place in which an animal or plant species lives. The concept of habitat includes not only the place where a species is found, but also the particular characteristics of that place, such as climate or the availability of suitable food and shelter, which make it especially well-suited to meet the life-cycle needs of that species.

Indicator species: An organism that indicates the presence or absence of any particular factor, e.g. fecal coliforms are used as an indicator species for the presence of disease causing organisms in drinking water.

Index: A number derived from a series of observations and used as an indicator or measure of a condition, property or phenomenon.

Inflation: A persistent rise in the price of goods, services, and factors of production over an extended period of time, as measured by a price index such as the Consumer Price Index or the Gross National Product Deflator. Inflation reduces the purchasing power of the dollar or any other unit of money, and tends to redistribute income from those with savings, including pensioners or those on fixed incomes, to those who owe money or have sufficient bargaining power in the economy to raise their prices, wages, or professional fees above the rate of inflation.

Infrastructure: The basic capital assets of a country; these assets are important to industrial development and economic growth. Infrastructure includes roads, electric-power systems, water supply systems, railways, telephone systems, serviced land for industry and housing, and other such facilities. Since the health and education of the workforce are important in economic development, investment in hospitals, schools, universities, and the like are also a part of infrastructure.

Intrinsic value: Those actions, states, beings, conditions, relationships, etc., that are valued for their own sake, not for what they lead to or produce. Hence, a person can value backcountry hiking for its own sake, not because it conditions the body, or because it gets him or her somewhere, but simply for its inherent goodness.

ISO 14000: Voluntary, international standards developed by the International Organization for Standardization (ISO) to provide industries with a structure to manage environmental impacts. The standards cover a broad range of environmental disciplines, including basic environmental management systems, auditing, environmental performance evaluation, labeling, and life cycle assessment. The standards offer firms a management system that will help them assess their environmental credentials and make improvements where necessary.

Leachate: A solution containing dissolved or suspended materials in water that has percolated through solids such as soils, solid wastes and rock layers.

Maximum Sustainable Yield: The maximum amount which can be harvested without reducing the stock which is available in subsequent years.

Natural region: A geographic area that has similar landforms, geology, climate and vegetation.

Per capita: Latin for "by heads." A measurement that is presented in terms of units per person, as opposed to a total or aggregate figure.

Photovoltaic cell: Converting light into electricity. Photo means light, voltaic means electric. Often referred to as PV for short. More commonly referred to as solar electric.

Predation: An example of interspecific association between species that may be positive or negative. Positive predation occurs when predator populations fluctuate in positive response to variations in prey. Negative predation occurs when high predator population densities produce a local population depression of prey.

Proxy: A measure of a particular thing as being representative of another thing which is more difficult or impossible to measure, or for which data is not currently being collected.

Quantitative: The measurement of a value or quantity using standard measurement methods such as volume, duration, length, weight.

Qualitative: The assignment of a value, such as good or bad, to a variable that would normally lack a means of quantification by standard measurement methods (length, width, volume).

Self-employed: Persons whose job consisted mainly of operating a business of professional practice, alone or in a partnership. This category includes the operation of a farm. A business can be either incorporated or unincorporated. An incorporated business has a legal entity under either federal or provincial laws.

Sustained yield: The amount of wood or other benefits that a forest can produce continuously at a given intensity of management.

Sustainable agricultural practices: The object of devising systems of agriculture that provide what is needed in ways that are non-polluting, meet the needs of farmers to diversify and are compatible with conservation.

Sulphur dioxide (SO_2): A colourless gas formed primarily by the combustion of fossil fuels that is one of the major contributors to acid rain. Sulphur dioxide and its atmospheric by-products can also cause respiratory ailments and cardiac problems. Sources of SO_2 include pulp mills, smelters, natural gas processing plants and the combustion of high sulphur fuels, such as coal and petroleum.

Systemic discrimination: In an employment context it is discrimination that results from the simple operation of established procedures of recruitment, hiring and promotion, none of which is necessarily designed to promote discrimination. It results from the application of established practices and policies that, in effect, have a negative impact upon the hiring and advancement prospects of a particular group.

Tailings: Material rejected from a mill after most of the recoverable valuable minerals have been extracted. Tailings are generally finely ground rock particles that are transported as a water slurry to a storage area, known as a tailings pond, at the mine site. Usually, the tailings composition is similar to that of the parent ore body and may therefore contain metals, sulphides, salts, or radioactive minerals.

Threatened species: A species indigenous to Manitoba, which is likely to become endangered, or is, because of low or declining numbers in Manitoba, particularly at risk if the factors affecting its vulnerability do not become reversed.

Unpaid family worker: Persons who work without pay in a family farm, business, or professional practice owned or operated by a related household member.

Year class strength: The numerical abundance of a group of fish that were all hatched in the same year. This is also called cohort strength. In Manitoba, it is measured by standardized trawl surveys and standardized index gill netting surveys.

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Provincial Sustainability Indicators Questionnaire

This questionnaire is provided to facilitate your written feedback on the Provincial Sustainability Indicators. Please see the workbook for complete descriptions of the categories, issues and indicators, and circle the appropriate word to indicate your preference. Additional comments and suggestions may be provided using additional sheets of paper if necessary. Please return your questionnaire in the enclosed self-addressed stamped envelope. Thank you for contributing.

1.0 Biodiversity and Habitat Conservation	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **1.1** Agree Neutral Disagree **1.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **1.1 (a)** Agree Neutral Disagree **1.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ Do you have other comments on this category? _____
2.0 Wildlife	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **2.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **2.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ Do you have other comments on this category? _____
3.0 Air	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **3.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **3.1 (a)** Agree Neutral Disagree **3.1 (b)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ Do you have other comments on this category? _____
4.0 Water	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **4.1** Agree Neutral Disagree **4.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **4.1 (a)** Agree Neutral Disagree **4.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ Do you have other comments on this category? _____

5.0 Fish	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **5.1** Agree Neutral Disagree **5.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **5.1 (a)** Agree Neutral Disagree **5.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
6.0 Forests	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **6.1** Agree Neutral Disagree **6.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **6.1 (a)** Agree Neutral Disagree **6.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
7.0 Minerals	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **7.1** Agree Neutral Disagree **7.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **7.1 (a)** Agree Neutral Disagree **7.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
8.0 Soil	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **8.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **8.1 (a)** Agree Neutral Disagree **8.1 (b)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____

9.0 Land Use and Human Settlement	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **9.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **9.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
10.0 Agriculture and Food	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **10.1** Agree Neutral Disagree **10.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **10.1 (a)** Agree Neutral Disagree **10.1 (b)** Agree Neutral Disagree **10.1 (c)** Agree Neutral Disagree **10.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
11.0 Energy	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **11.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **11.1 (a)** Agree Neutral Disagree **11.1 (b)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
12.0 Consumption	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **12.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **12.1 (a)** Agree Neutral Disagree **12.1 (b)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____

13.0 Economic Activity	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **13.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **13.1 (a)** Agree Neutral Disagree **13.1 (b)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
14.0 Demo-graphics	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **14.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **14.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
15.0 Basic Services	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **15.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **15.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
16.0 Employment	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **16.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **16.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____

17.0 Education and Training	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **17.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **17.1 (a)** Agree Neutral Disagree **17.1 (b)** Agree Neutral Disagree **17.1 (c)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
18.0 Equity and Rights	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **18.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **18.1 (a)** Agree Neutral Disagree **18.1 (b)** Agree Neutral Disagree **18.1 (c)** Agree Neutral Disagree **18.1 (d)** Agree Neutral Disagree **18.1 (e)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
19.0 Community and Culture	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **19.1** Agree Neutral Disagree **19.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **19.1 (a)** Agree Neutral Disagree **19.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
20.0 Governance	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **20.1** Agree Neutral Disagree **20.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **20.1 (a)** Agree Neutral Disagree **20.2 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____

21.0 Health	Do you agree that the issues presented in this category are the key areas to track to help determine sustainability in Manitoba? **21.1** Agree Neutral Disagree **21.2** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issues? **21.1 (a)** Agree Neutral Disagree **21.1 (b)** Agree Neutral Disagree **21.1 (c)** Agree Neutral Disagree **21.2 (a)** Agree Neutral Disagree **21.2 (b)** Agree Neutral Disagree **21.2 (c)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
22.0 Justice	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **22.1** Agree Neutral Disagree	Given the indicator selection criteria, do the proposed indicators sufficiently address the issue? **22.1 (a)** Agree Neutral Disagree **22.1 (b)** Agree Neutral Disagree **22.1 (c)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____
23.0 Perceived Quality of Life	Do you agree that the issue presented in this category is the key area to track to help determine sustainability in Manitoba? **23.1** Agree Neutral Disagree	Given the indicator selection criteria, does the proposed indicator sufficiently address the issue? **23.1 (a)** Agree Neutral Disagree	Are there alternative indicators that would better represent the issue; if so, which ones could be replaced and why? _____ _____ _____ Do you have other comments on this category? _____ _____ _____